



FRIDAY, JANUARY 28, 1881.

## Contributions.

## Plan for a Switch.

BRUNSWICK, Maine, Dec. 15, 1880.

TO THE EDITOR OF THE RAILROAD GAZETTE:

MY DEAR SIR: In looking over some old drawings lately, I came across the inclosed plan for a switch, a model of which I made in 1853. Compared with the common switch, the heel and toe have, so to speak, changed places, and the point in the main track, commonly known as the heel, becomes the point where the curve commences, the curve being tangent to the main track at this place, thus avoiding the angle between the main line and the switch-rail when switched. The two pieces of rail, the one straight and the other curved, were to be fastened to a heavy plate, the whole turning on the two centres shown in the sketches at the right hand of the switch. This switch was intended particularly for quite sharp turnout curves. The distance from the toe of the switch to the point of the frog is quickly found, being simply the half chord, of which the width of gauge is the versed sine, and the radius, of course, is given. Fig. 1 shows the main line open, and fig. 2 shows the turnout open. I have an impression that this device was published in a book called "Hand-book of Railroad Construction," in 1857, but, having no copy of the work, I am not sure.

GEO. L. VOSE.

## An Apparition on the Track.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I am a locomotive engineer, at present running engine No. 167 on a passenger train on the Chicago, Rock Island &

a well-known fact that conviviality has an effect upon the organs of vision. Cases have been known of persons in whom color-blindness succeeds festivity, seeing double, refracted vision, hallucination, as of stars, are all well recognized phenomena which succeed excessive exhilaration. However, it would be unfair to treat our correspondent's letter with levity alone, as it seems to be written in good faith. Occurrences such as he recites, though, require the most indubitable evidence to be credited, owing to the liability of observers in such cases to be mistaken. If, as apparently was the case, the matter was the subject of an official investigation, a report of the evidence submitted might have very great scientific interest.—EDITOR OF THE RAILROAD GAZETTE.]

## Calculating Quantities in Earthwork.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Perhaps your correspondents, S. E. Reaugh and "J. T. D.," will be interested in seeing one more method of computing earthwork—known as the method by diagrams, of the subscriber—which must be wholly new to them, or neither of them would have gravely proposed the methods which they do in your columns.

Here is Mr. Reaugh's hypothetical solid:

Road-bed, 12 ft.; slopes,  $\frac{1}{2}$  to 1.

Station.	Cross Section.			Distance between slope stakes.
64	+3.0	+4.2	+8.0	17.5
	7.5		10.0	
	+10.0		+21.6	
+70	11.0	+18.4	16.8	27.8

The published plates of the aforesaid diagrams do not in-

clude labor of earthwork estimates of every form and kind is practically done away with, while, at the same time, a very substantial increase in practical accuracy is secured.

I dislike to seem to puff my own method, and will therefore say at once that I have no interest in the sale of the work beyond the usual author's copyright. But I regard it as a duty to preach the gospel of common sense in earthwork computation when the occasion seems to demand it, as I have done in your columns and elsewhere, and the very rapid exhaustion of the first edition of these diagrams within the past few months has convinced me that engineers are at last very generally waking up to the fact that there is such a method, and that they are a little behind the age if they do not use it. No method by tables or otherwise does or ever can by possibility take its place, or serve to any appreciable extent as an equivalent, and hence the only matter of surprise is that it should have taken engineers as long as it has to find this out. It can only be the reluctance of the great bulk of mankind to get out of old ruts and take hold of a new thing.

There is an old story of a darkey of the old régime who was found in a pouring rain with his head all exposed and his hat carefully stored under his coat, and who remarked when expostulated with that "de ole head is massa's, but de hat belongs to dis nigger." Possibly there are still a few engineers who, on the same principle, look upon their time and their pencils as belonging to the company and no concern of theirs, but their brains as belonging to "dis nigger," and to be carefully economized. And indeed anyone must have need to who will of malice or forethought figure out earthwork numerically after he has learned that it can be avoided.

A. M. WELLINGTON.

## Corrections of Record of New Railroad Construction in 1879.

We have been accustomed at some time in the first half of the year to supplement our annual record of the railroad construction, which we published in January, by a list of additions and corrections. We did not do this in 1880, and we present now the corrections, in accordance with which

FIG. 1.

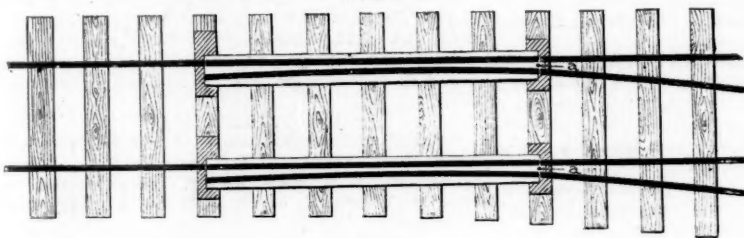
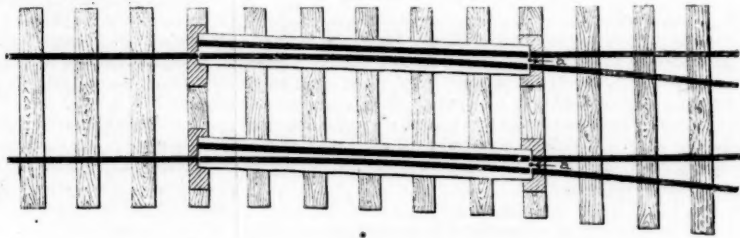


FIG. 2.



PLAN FOR A SWITCH.

Pacific Railroad, between Davenport and Brooklyn, in Iowa. I am in search of information, but as I am not much at letter-writing, I fear I may not be able to make myself understood, but will try.

At 12.30 on the night of Dec. 28, of last year, when the thermometer was 25 degrees below zero, and the wind was blowing from the northwest, I saw, on a straight piece of track five miles in length, a head-light coming in the opposite direction. At first it did not appear bright or definite in shape. I of course shut off steam and ran slow, and then called my fireman's attention to what I supposed was an approaching train. The head-light by this time was quite distinct, and apparently not more than a mile from us. I then stopped and made up my mind that if the approaching train did not back out of my way I would let whoever was to blame settle with the Superintendent for a violation of time-card rules. I put the reverse lever back in the "corner," but on came the head-light, quivering just as any head-light does when on an engine that is in motion. I waited until the reflection shone on the track in front of my engine, and then ran back a mile and a half to a station and asked the train dispatcher what train that was between Marengo and Ladora on my time and rights, of which I had no warning or orders against. Imagine my surprise when informed that there was no train between me and Brooklyn (four stations ahead). I did not know at this time that any one except my fireman and I had seen the head-light, and when the train dispatcher said there was no train between me and Brooklyn a gentleman who was a passenger on my train said, "I am accustomed to look at head-lights, and will swear that was a head-light you stopped for." So will I, Mr. Editor, but I now believe that it was my own; but how I was enabled to do it is just what I would like to know.

Let me state further that while I was standing still the baggage-man opened his car door, saw what was the trouble and told the night mail agent of it. The brakeman and conductor got down on the ground and saw the head-light, making in all seven persons.

Last Sunday was the first opportunity that offered itself for me to make my statement to our General Superintendent, Mr. A. Kimball, and account to him for the 25 minutes time that I lost. He made the remark: "I have never heard of anything like that before and cannot explain to you, but I suppose some of the scientific papers could."

The weather was not foggy nor starlight; the clouds seemed to be heavy laden and would like to storm, but could not.

A. B. C.

[We can give no explanation of this occurrence, excepting that it occurred soon after Christmas, and it is

clude this very peculiar road-bed, although one is easily constructed for any road-bed, by the directions given, in half a day or more. We will therefore compute the solid from the "Diagram of Triangular Prisms," which is applicable to all road-beds and all solids, regular or irregular.

How does the following strike your correspondents as an alternative to their methods? It is given precisely as first read off on inspection without the alteration of a single figure:

Entering the diagram with..... 4.2 and 17.5	We read off on inspection, for 50 ft., solid cu. yds. ....	60
do. do. .... 6.0 " 11.0	do. do. ....	61

Total for first section..... 130

Entering the diagram with..... 18.4 and 27.8	We read off on inspection, for 50 ft., solid cu. yds. ....	473
do. do. .... 6.0 " 31.0	do. do. ....	176

Total for second section..... 649

Total "end-area" solidity of the entire solid, if 100 ft. long, sum of above, or..... 779

Or for a solid 70 ft. long..... 779x.7= 545.3

Quantities made up in this way will do very well for temporary purposes, monthly estimates, etc.; but when leisure serves we run through the whole notes, and on such comparatively few solids (like the above) as require it, determine corrections like the following, to be subtracted in gross from the total "end-area" quantities on a section or division:

Entering the "diagram of prismoidal correction" with the difference between centre heights, or (18.4-4.2)=14.2 and the difference in total width or (27.8-17.5)=10.3	We read off on inspection 46 cu. yds.	
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Which is the difference between the "end-area" volume and the true solidity for the solid if it were 100 feet long. The solid being but 70 ft. long, we have:

End-area volume above.....	46x.7 = 32.2 cu. yds.	
	545.3 "	

True solidity..... 513.1 cu. yds.

As computed by S. E. R. and "J. T. D.," with a little million of figures..... 513.2 cu. yds.

Do not your correspondents think that this method—which is but a fair sample of the accuracy which can be habitually obtained—is a little ahead of their present ideas? They will observe that had the solid been 100 ft. long there would not have been a single multiplication or division of any nature or kind whatsoever. They will also observe that had they given an example of a usual road-bed, the labor (if it can be called such) would have been but half as great, for each section would have been taken off at one inspection instead of two. They will also, I trust, believe my statement that any intelligent rodman can learn in an hour or two to take off quantities as fast as another man can call off from the notes and set down the readings. Thus the en-

we change the totals in the different states and in the country in the tables which we give with our record for 1880:

**Pontiac Branch.**—Completed in December from the New York, Providence & Boston, at Auburn, R. I. (5 miles from Providence), westward 4.69 miles to Pontiac, where it met the *Pontiac Valley* road, which, for some years in operation for three miles from Hope to River Point, in 1879 was extended eastward 2.67 miles to Pontiac. Since 1879, the two have been operated together by the New York, Providence & Boston as its *Pontiac Valley Branch* 10½ miles long, from Auburn to Hope.

**Bangor & Portland.**—Completed Jan. 1, from the Delaware, Lackawanna & Western at Portland, Pa., 8 miles to Bangor, where are the largest slate quarries in the country. During 1880 it was graded for a further extension of seven miles to Penargyl, where there are more slate quarries.

**Dayton, Covington & Toledo.**—The length of this line, completed the end of 1879, was 25½ miles, instead of 35, as we reported, bringing it to Covington instead of Versailles, Ga., 3 ft.

**Detroit, Lansing & Northern.**—The *Stanton Branch* was extended from Blanchard, the 1878 terminus, north and west 11 miles to Mecosta.

**Flint & Pege Marquette.**—The *Saginaw & Clare County Branch* was extended northward 30 miles, making it 8.91 miles long from the junction with the main line.

**Chicago, Burlington & Quincy.**—During this year the company completed a line 6½ miles long from Rock Island, Ill., eastward to Port Byron Junction, giving it an independent entrance from its St. Louis & Rock Island Division into Rock Island, where formerly it had used the track of the Chicago, Rock Island & Pacific Railroad.

**Illinois Central.**—A branch of the Kankakee & Southwestern had the track laid on it from Kempton Junction (25 miles from the junction with the Chicago Division at Otto) west 12 miles.

**Chicago & Northwestern.**—The *Appleton Water Power Extension*, 3½ miles, was completed in 1879.

**Chicago, Milwaukee & St. Paul.**—The *Iowa & Dakota Division* was completed from Marion Junction west 44 miles to Bridgewater, more than was included in our report.

**Wabash, St. Louis & Pacific.**—The *Clarinda Branch* of the St. Louis and Omaha line was completed in 1879 from Roseberry, Mo. (80 miles southwest of Council Bluffs), north 21½ miles to Clarinda, Iowa, nearly by the side of a branch of the Chicago, Burlington & Quincy. Ten miles of it are in Missouri.

**Chicago, Burlington & Quincy.**—The following corrections of the lengths of the numerous branches of this road built in Iowa in 1879 are submitted:

	Our report.	Actual.	Feet.
Des Moines & Knoxville, Knoxville to Des Moines.	30	34	4,854
Chariton to Indianola, extension to Indianola.	13	16	1,584
Leon to Mt. Ayr.	35	35	2,328
Creston & Northern, extension to Fontanelle.	9½	7	1,584
Clarinda to Burlington Junction (10 miles in Mo.).	21	23	4,118
Red Oak & Atlantic (Red Oak north).	—	15	3,400
Total.....	114½	130	2,042

That is, the company built 16 miles more than reported, consisting chiefly in the omitted Red Oak & Atlantic road, and all the increase is in Iowa.

**Atchison, Topeka & Santa Fe.**—The *Cowley, Sumner &*



**Fort Smith road** was completed 13 miles further than was reported, to the Indian Territory line at Arkansas City, near the Arkansas River, making that road 51 miles long from Wichita, and in connection with the Wichita & Southwestern, making a branch of the main line 78 miles long from Newton down the Arkansas Valley, south by east.

**Atchison, Topeka & Santa Fe.**—The length of track laid by this company up the Arkansas from Pueblo, on the line which was turned over to the Denver & Rio Grande and is now its Leadville line, was 54 miles, which is 47 more than we reported.

**Atchison, Topeka & Santa Fe.**—The main line in New Mexico was completed  $4\frac{1}{2}$  miles further than we reported, to a point  $59\frac{1}{2}$  miles below Los Vegas.

**Utah & Northern.**—The end of the track was at the Montana line, and  $284\frac{1}{2}$  miles from Ogden, at the end of 1879, as reported by the Union Pacific this year, which is  $25\frac{1}{2}$  miles less than we reported on the authority of the contractor, who, however, had not at that time positive information that the track was laid so far, but supposed that it must be.

The **Whitman & Weston** Railroad, now the Blue Mountain Extension of the Walla Walla & Columbia River, is 14 miles long instead of 20, from the last-named road at Whitman, five miles east of Walla Walla, south to Blue Mountain; three miles are in Washington and 11 in Oregon.

**South Pacific Coast.**—This road was extended  $12\frac{1}{2}$  miles in 1879 towards Santa Cruz, and was the only new road built in California that year. Gauge, 3 ft.

The additions and deductions for the several States are:

Additions.		Deductions.	
Rhode Island.....	$7\frac{1}{2}$	Ohio.....	$9\frac{3}{4}$
Pennsylvania.....	8	Idaho.....	$5\frac{1}{2}$
Michigan.....	14	Montana.....	20
Illinois.....	$18\frac{1}{2}$	Oregon.....	6
Wisconsin.....	$3\frac{1}{2}$		
Dakota.....	15	Total.....	$41\frac{1}{2}$
Iowa.....	$27\frac{1}{2}$		
Missouri.....	10		
Kansas.....	13		
Colorado.....	47		
New Mexico.....	$4\frac{1}{2}$		
California.....	$12\frac{1}{2}$		
Total additions.....	180 $\frac{1}{2}$		
Total deductions.....	$41\frac{1}{2}$		
Balance, add.....	139 $\frac{1}{2}$		

These constructions make the total mileage completed in the United States in 1879 4,570 miles, of which 895 miles were of narrow gauge ( $3\frac{1}{2}$  feet or less).

#### Record of New Railroad Construction in the United States in 1880.

We give below our usual yearly record of the new railroad on which track was laid in the United States in 1880, the information of which has been collected with very great labor and care, chiefly by personal inquiry and correspondence, so that we believe it to be very nearly complete and accurate. If readers detect any errors, we will thank them to inform us. The effort is to count all new railroad (not second track or sidings), on which track was laid during the year, and only that.

##### MAINE.

**Old Orchard Beach.**—Completed from the Boston & Maine road, at Old Orchard Beach, Me., along the beach for 3 miles to the mouth of the Saco River. Gauge 3 ft.

##### VERMONT.

**Brattleboro & Whitehall.**—Completed from a junction with the New London Northern at Brattleboro, Vt., northward 36 miles to Londonderry. It is worked by the New London Northern. Gauge, 3 ft.

##### MASSACHUSETTS.

**Massachusetts Central.**—The first track was laid on this road, being at different points on the line west of Stony Brook, Mass., and making 14 miles in all.

**Nantasket Beach.**—Completed from Point Allerton landing along Nantasket Beach, a popular Boston seaside resort reached by steamboats, to the Nantasket House, 3.14 miles.

**New Haven & Northampton.**—This road was extended from Northampton, Mass., northward 18.52 miles (generally at a little distance east of the Connecticut River Railroad) to a junction with the Troy & Greenfield Railroad at the west end of the Bardwell's Ferry bridge, making the road  $94\frac{1}{2}$  miles long from New Haven north, and a branch of the same from South Deerfield northeast 10.3 miles to Turner's Falls had the track laid on it for 6 miles.

##### CONNECTICUT.

**New York & New England.**—This road was extended during the year from Waterbury, Conn., southwestward toward the Hudson, and by the end of the year had reached the New York state line, 32.7 miles, making the road 184 miles long from Boston westward.

##### NEW YORK.

**Jerome Park.**—Completed from a junction with the Harlem Division of the New York Central & Hudson River road to the race course at Jerome Park, just above New York. Its length is 1 mile. Opened May 29.

**Long Beach.**—Completed from a junction with the Brooklyn & Montauk Division of the Long Island Railroad south and east 6 miles to Long Beach, N. Y., on the south shore of Long Island, where a great seaside hotel was built in connection with the road. It is worked by the Long Island road. It was opened in July.

**Metropolitan Elevated.**—Extended from Chatham square, in New York city, northward, most of the distance in Second avenue, to One Hundred and Twenty-seventh street, near the Harlem River, a distance of  $6\frac{1}{4}$  miles—all a double-track iron bridge.

**New York Central & Hudson River.**—An extension of 1 mile was built at great cost in the city of Buffalo.

**New York, Woodhaven & Rockaway.**—Completed from a junction with the Long Island Railroad at Glendale Junction ( $6\frac{1}{2}$  miles from the terminus at Hunter's Point, opposite New York), southward 10.34 miles to Rockaway Beach, crossing Jamaica Bay for several miles on piles. It is built in connection with a vast hotel on the beach for excursion traffic, and was opened Aug. 26.

**Tonawanda Valley.**—Completed from a junction with the Buffalo Division of the New York, Lake Erie & Western, at Attica (31 miles east of Buffalo), south by west 19 miles to Currier's Corners. Gauge, 3 ft.

Also, 4 miles of the **Warwick Valley** road (given under New Jersey), are in New York.

##### NEW JERSEY.

**Central Railroad of New Jersey.**—The Long Branch Division was extended from Sea Girt, N. J., southward 3 miles to Point Pleasant, making the division  $49\frac{1}{4}$  miles long from the junction with the main line at Elizabethport.

**Philadelphia & Atlantic City.**—The Pleasantville & Ocean City Branch was completed from the main line at Pleasantville (six miles from Atlantic City)  $7\frac{1}{2}$  miles to Somers' Point. Gauge,  $3\frac{1}{2}$  ft.

**Philadelphia, Marlton & Medford.**—This line was graded from its junction with the Camden & Atlantic near Haddonfield, N. J.,  $6\frac{1}{2}$  miles from Camden, east 11.2 miles to Medford, and track was laid for  $1\frac{1}{2}$  miles from the junction. It will be worked as a branch of the Camden & Atlantic.

**Warwick Valley.**—An extension was completed early in the year from Warwick, N. Y., southwestward  $11\frac{1}{2}$  miles to the Sussex Railroad at McAfee Valley, N. J., making the road  $21\frac{1}{2}$  miles long from the Erie at Greycourt southwest. Of the extension 4 miles are in New York.

**Watchung.**—This road, built several years ago but abandoned a few months after it was opened, in November was extended half a mile to Main street, in West Orange, N. J., making it  $4\frac{1}{2}$  miles long from its junction with the New York & Greenwood Lake road, at Woodside Park, west to West Orange. It is to be worked as a branch of the Greenwood Lake road, for suburban traffic.

**West Jersey & Atlantic.**—Completed from a junction with the West Jersey Railroad at Newfield, N. J. (30 miles from Camden), east by south 34.46 miles to Atlantic City, with the West Jersey completing a new line  $64\frac{1}{2}$  miles long from Camden to Atlantic City. It is worked by the West Jersey.

##### PENNSYLVANIA.

**Bell's Gap.**—Extended from its former terminus at Lloydsville, Pa., northwestward 12 miles over coal lands to Utahville, in Clearfield County, making the whole road 20 miles long from its junction with the Pennsylvania Railroad at Bell's Mills. Gauge, 3 ft.

**Bradford, Bordell & Kinzua.**—This road was built from Bradford, Pa., 13 miles to Bordell, with a branch from Kinzua Junction (10 miles from Bradford) to Simpson, 5 miles. Under the charter of the Bradford, Bordell & Smethport Company, an extension was built from Simpson to Smethport,  $11\frac{1}{2}$  miles. Gauge, 3 ft.

**Eminton, Shippensburg & Clarion.**—A branch was completed from Pike Siding northward 4.4 miles to Bagaley's mills at Arthur post-office. Gauge, 3 ft.

**Long Valley.**—Completed from the Barclay Railroad at Lamoka, Pa., northward 7 miles to the Long Valley coal mines. It is built to serve the mines.

**Montour.**—This road was extended from the 1879 terminus 9 miles to Jeffreystown, Pa., making it 12 miles long from its junction with the Pittsburgh & Lake Erie at Montour Junction.

**Pennsylvania.**—The Lewisburg & Tyrone Branch was extended from Tyrone, Pa., eastward 17 miles to Pennsylvania Furnace. Between the latter part and the old part of the road at Spring Mills there remains a gap of about 25 miles.

The **Pittsburgh, Virginia & Charleston Division** was extended from Monongahela City, Pa., southward up the Monongahela River 11 miles to Belle Vernon.

The **Southwest Pennsylvania Branch** was extended early in the spring from Oliphant south 2 miles to Fairchance, making the branch 44 miles long from its junction with the main line at Greensburg.

**Pittsburgh & Western.**—This road (last year the Pittsburgh, New Castle & Lake Erie), was extended during the winter from the late northern terminus at Zelenople, Pa., west by north 10.7 miles to Wurtemburg, making the road 45 miles long from its terminus in Allegheny City. Gauge, 3 ft.

**Pittsburgh, Titusville & Buffalo.**—The Titusville & Oil City Branch was completed from Oil City, Pa., northward 9 miles to Petroleum Centre, over an old abandoned road-bed.

**Sharpsville.**—The **Gilkey Run Branch**, 1.36 miles long, was completed from near Carbon Station to Shaft No. 1 of the Pierce Coal Co.

**Somerset & Cambria.**—Extended from Somerset, Pa., north by east 37 miles to Johnstown, making it 46 miles long from its junction with the Pittsburgh Division of the Baltimore & Ohio at Mineral Point. It is worked by the Baltimore & Ohio road, and will enable it to get some share of the immense freight of the Cambria Iron Works.

**Western Maryland.**—The Baltimore & Cumberland Valley line, of which three miles were completed in 1879, from the main line at Edgemont northwest to the Pennsylvania line, was extended in 1880  $4\frac{1}{2}$  miles to Waynesboro, Pa.

**Wilmington & Northern.**—The French Creek Branch was completed in April from a junction with the main line near Springfield, Pa., eastward 6 miles to French Creek Falls.

##### MARYLAND.

**George's Creek & Cumberland.**—Completed from a junction with the "Pennsylvania Railroad in Maryland,"  $1\frac{1}{2}$  miles west of Cumberland, Md., west by south  $19\frac{1}{2}$  miles to the mines of the Maryland Coal Co., at Lonaconing, with a branch from Midland Junction (about five miles northeast of Lonaconing) southward  $4\frac{1}{2}$  miles to the mines of the American Coal Co. It is worked in connection with the

Pennsylvania Railroad in Maryland, which is the Pennsylvania Railroad's connection (through its Bedford Division) with the Cumberland coal fields. The new line is near to, and parallel with, the Cumberland & Pennsylvania Railroad.

**Shenandoah Valley.**—Completed from the Potomac River at Shepherdstown (northern terminus), at beginning of 1880, northward 16.9 miles to Cumberland Valley Railroad at Hagerstown, Md.

##### VIRGINIA.

**Charlottesville & Rapidan.**—Completed from Charlottesville, Va., north by east 28.2 miles to the Virginia Midland near Orange Court House. It was built to give the latter road an independent line where it has heretofore used the track of the Chesapeake & Ohio over this part of its main line.

**Franklin & Pittsylvania.**—Completed from Pittsville, Va. (the terminus of the Pittsylvania Railroad), westward 29 miles to Rocky Mount, the county seat of Franklin County, and with the Pittsylvania forming a line 37 miles long from the junction with the Washington City, Virginia Midland & Great Southern 27 miles north of Danville. Gauge, 3 ft.

**Richmond & Allegheny.**—Track was laid on the line of this road, which is generally the bed or the tow-path of the James River Canal, from Richmond, Va., westward 59 miles to a point two miles beyond Columbia. On the western end track was laid from a junction with the Chesapeake & Ohio at Williamson (Clifton Forge) southward 30 miles to the western terminus of the canal at Buchanan, and down the canal 4 miles.

**Shenandoah Valley.**—Extended from the 1879 terminus at Riverston, Va. ( $42\frac{1}{2}$  miles south of Shepherdstown) south by west 16.5 miles to Milford, and from the Chesapeake & Ohio Railroad at Waynesboro north by east 37 miles to Shenandoah Iron Works, together with 3.3 miles of track not yet opened for trains, leaving a gap of about 28 miles in the entire line of 144 miles from Hagerstown to Waynesboro.

##### NORTH CAROLINA.

**Chester & Lenoir.**—Extended from Dallas, N. C., northward  $3\frac{1}{2}$  miles to the Catawba River, making the road  $49\frac{1}{2}$  miles long, from Chester, S. C., northward. Gauge, 3 ft.

**Western North Carolina.**—Extended westward 12 miles to Asheville Depot (about two miles from Asheville, N. C.), making the road 148 miles long from Salisbury westward.

**Cheraw & Salisbury.**—Of the line of this road from Cheraw, S. C., to Wadesboro, N. C., 15 miles are in North Carolina.

##### SOUTH CAROLINA.

**Barnwell & Blackville.**—Completed from the South Carolina Railroad at Blackville, S. C., southwestward 13 miles to Barnwell. It was opened April 2. It is owned chiefly by Mr. J. B. Woodward, of Barnwell, and is a very light, cheap road.

**Cheraw & Chester.**—Extended from the Catawba River east 8 miles to Lancaster, S. C., making the road  $30\frac{1}{2}$  miles long from Chester east. Gauge, 3 ft.

**Cheraw & Salisbury.**—Completed from Cheraw, S. C. (the northern terminus of the Cheraw & Darlington, of which this road is an extension), northwestward 25 miles to a junction with the Carolina Central at Wadesboro, N. C. In connection with the Cheraw & Darlington and the Northeastern, this completes a line from Charleston, S. C., nearly due north 167 miles to the Carolina Central at Wadesboro, and gives a southern outlet to the latter road. Gauge, 5 ft. About 15 miles of the new road are in North Carolina.

##### GEORGIA.

**Atlanta & Charlotte Air Line.**—On the Lawrenceville Branch, which is to extend from this road at Suwanee (30 miles northeast of Atlanta) south  $9\frac{1}{2}$  miles,  $3\frac{1}{2}$  miles of track were laid at the end of the year. Gauge, 3 ft.

**Columbus & Rome.**—This company, formerly the North & South of Georgia, extended its road northward  $4\frac{1}{2}$  miles to Hood, making it 32 miles long from Columbus northward. Gauge, 3 feet.

**Savannah, Florida & Western.**—The Waycross  $\frac{1}{2}$  Florida road was completed from a junction with the main line at Waycross, Ga. (92 miles southwest of Savannah), south east 23 miles, toward Jacksonville. It will make a much directer route than the old one to Jacksonville, being 163 miles against 261 by the old route. Gauge, 5 feet.

**Walton.**—Completed near the end of the year from a junction with the Georgia Railroad at Social Circle, Ga. (52 miles east of Atlanta), north 10 miles to Monroe, the county seat of Walton County. It is worked as a branch of the Georgia Railroad. Gauge, 5 feet.

**Western & Atlantic.**—A branch 4 miles long was completed from a point near Centerville, Ga., to some iron ore beds.

##### FLORIDA.

**St. John's & Lake Eustis.**—Completed by an extension of 14 miles to Lake Eustis, Fla., at Fort Mason, making the road 26 miles long from the St. John's River at Astor (a few miles south of Lake George) southwestward to Fort Mason. Gauge, 3 ft.

**Savannah, Florida & Western.**—The East Florida Railroad (which, in connection with the Waycross & Florida, will make the new line between Jacksonville and Savannah) was completed from Jacksonville, Fla., westward  $1\frac{1}{2}$  miles.

**South Florida.**—Completed from Sanford, Fla., on Lake Monroe, St. John's River, south by west 22 miles to Orlando. Gauge, 3 ft.

##### ALABAMA.

**Louisville & Nashville.**—This company extended its leased Pensacola & Selma line from the late northern terminus on the south side of the Alabama River 6 miles to a junction with the Western Railroad, giving it an entrance into Selma. On the southern end this road was built from



Pensacola Junction northward 16 miles, leaving 30 miles to be completed. Gauge, 5 ft.

## LOUISIANA.

*Louisiana Western.*—Completed in August by the laying of track from Vermillionville, La., west 56 miles, and from the Sabine River east 22 miles to the section of road 27 miles long completed in 1877, making the road 112 miles long from Orange, Tex., east to Vermillionville, and in connection with Morgan's Louisiana & Texas road on the east, and the Texas & New Orleans on the west, completing a line 360 miles long from the Mississippi opposite New Orleans to Houston, Tex.

*Morgan's Louisiana & Texas.*—Extended early in the year from New Iberia, La., northward 18 miles to Vermillionville, where it meets the Louisiana Western from Texas. Late in the year an extension was completed from Vermillionville northward 28 miles through Opelousas to Washington, on the way to the Red River at Alexandria, 60 miles, on which work is progressing, and which is expected to be completed about next May.

## TEXAS.

*Corpus Christi, San Diego & Rio Grande.*—This road at the beginning of the year extended from Corpus Christi, Tex., due west 53½ miles to San Diego. In 1880 an extension towards Laredo was begun, on which track was laid for 5 miles southwest, and most of the grading completed about 50 miles further to Albarca, whence the line is to extend west by north to Laredo. Gauge, 3 ft.

*Dallas & Wichita.*—Extended from the former terminus at Lewisville, Tex., northward 17 miles to Denton, making the road 39 miles long from Dallas northwest. It will be worked as a branch of the Texas & Pacific.

*East Line & Red River.*—Extended from Sulphur Springs, Tex., westward 30 miles to Greenville, making the line 123 miles long from Jefferson west by north. Gauge, 3 ft.

*East Texas.*—On this road the first track was laid, from the Texas & New Orleans at Beaumont north 6 miles to Pine Island Bayou.

*Galveston, Harrisburg & San Antonio.*—The *La Grange Branch* was built from the main line at Smith's Junction (three miles east of Columbus), west by north 16 miles to Ellinger.

*Gulf, Colorado & Santa Fe.*—Extended from Sealy, Tex., northwest 110 miles to Rogers, making the road 204 miles long from Galveston northwest.

*Houston & Texas Central.*—The *Texas Central* road, which is an extension of this company's *Waco & Northwestern Division*, was extended from Whitney, Tex., westward 67 miles to Mt. Airy, Erath County, making the division 142 miles long from its junction with the main line at Bremond, which is 143 miles north of Houston.

*Houston, East & West Texas.*—Extended from Trinity River, Tex., northeastward 12 miles to Livingston, Polk County. Gauge, 3 ft.

*International & Great Northern.*—Extended from the former terminus at Austin, Tex., southwestward 62 miles to Davenport, making this line of the company 323 miles long from its junction with the Texas & Pacific at Longview southwest, and bringing it within 18.3 miles of San Antonio, which it will probably reach this month.

*Missouri, Kansas & Texas.*—The *Denison Division* (late *Denison & Southeastern*) was extended from Whiteright, Tex., southeastward 32 miles to Greenville, the county seat of Hunt County, making the division 52 miles long from its junction with the main line at Denison.

*Texas & Pacific.*—Extended from the former terminus at Fort Worth, Tex., westward 151 miles, making the main line 404 miles long from Texarkana.

The *Transcontinental Division* was extended from Sherman westward 17 miles to a junction with the Missouri, Kansas & Texas at Whitesboro.

*Texas & St. Louis.*—This company at the end of 1879 had two sections of road, one of 30 miles from Texarkana southwest, and one of 31 miles from Big Sandy to Tyler. In 1880 it filled the gap of 76 miles from Sulphur Fork southwest to Big Sandy, and extended the line from Tyler southwest 52 miles to the Trinity River. Gauge, 3 ft.

## ARKANSAS.

*Iron Mountain & Helena.*—Extended from the 1879 terminus, six miles south of Marianna, Ark., northwestward 6 miles to Marianna, making the road 18 miles long from its junction with the Arkansas Midland, 10 miles west of Helena, northwestward. Gauge, 3½ ft.

*Little Rock, Mississippi River & Texas.*—The *Little Rock Division* was extended from the old terminus at Pine Bluffs, Ark., northwestward up the Arkansas River towards Little Rock 25 miles, making it 95 miles long from the Mississippi River at Arkansas City northwestward, and bringing it within 19 miles of Little Rock.

The *Ouachita Division* was extended from Collins westward 16 miles to Monticello, making it 34 miles long from its junction with the other line at Trippes, seven miles from Arkansas City.

The *Rob Roy Branch* was completed early in the year from a point three miles east of Pine Bluff north 3½ miles to the Arkansas River at Micawber.

*Washington & Hope.*—This road, which was built as a wooden road before 1890, and worked with horses, was laid with iron and provided with locomotives in 1880. It extends from a junction with the St. Louis, Iron Mountain & Southern at Hope, Ark. (112 miles southwest of Little Rock and 33 northeast of Texarkana), northwestward 10 miles to Washington.

## TENNESSEE.

*Nashville & Florence.*—Completed from a junction with the Nashville & Decatur line of the Louisville & Nashville,

at Columbia, Tenn. (45 miles south of Nashville), west by south 11 miles to Mt. Pleasant. Gauge, 5 ft.

*Nashville, Chattanooga & St. Louis.*—This company's *McMinnville & Manchester* road was extended (but not completed so as to be operated) from McMinnville, Tenn., northwestward 13 miles to Caney Fork, making the line 48 miles long from the junction with the main line at Manchester northeastward. Gauge, 5 feet.

*Oakdale & Cumberland Mountain.*—Completed late in the year from the Cincinnati Southern, at Oakdale Junction (3 miles from Hunicutt, Tenn.), eastward 8 miles to Oakdale furnace. Gauge, 3 ft.

## KENTUCKY.

*Chatteroi.*—Completed from the Elizabethtown, Lexington & Big Sandy road at Catlettsburg, Ky., southward up the Big Sandy River 25 miles to Louisa. The trains run from the Ohio River at Ashland, six miles above Catlettsburg, on the Elizabethtown, Lexington & Big Sandy.

*Louisville & Nashville.*—The *Cumberland & Ohio Branch* was extended early in the year to Greensburg, Ky., 1½ miles, making the branch 31 miles long, from Lebanon southwest. Gauge, 5 ft.

*Louisville, Cincinnati & Lexington.*—The *Shelbyville Branch* of this road was extended by the construction of the *Cumberland & Ohio Railroad, Northern Division*, from its southern terminus at Shelbyville, Ky., southward 15 miles to Taylorsville.

Six miles of the *Elizabethtown, Lexington & Big Sandy*, from the Big Sandy River northwest to Ashland, are in Kentucky.

## WEST VIRGINIA.

*Elizabethtown, Lexington & Big Sandy.*—On this road, which is to connect the Chesapeake & Ohio with the West, track was laid from Huntington, W. Va., along the south bank of the Ohio westward to Ashland, Ky., 16 miles, of which six miles are in Kentucky.

## OHIO.

*Cincinnati Northern.*—This company, the successor of the *Miami Valley*, laid track in 1880 on 24½ miles of road, from the Marietta & Cincinnati Railroad at Norwood, O. (10 miles from Cincinnati), northeastward to Lebanon, a few miles west of the Little Miami. Gauge, 3 ft. Trains had not been put on the road at the close of the year, but were to be Feb. 1. A further extension is to be made southward to Cincinnati, and northeast 41 miles to Waynesville, and also north about 20 miles to Dayton; the latter giving the Toledo, Delphos & Burlington a narrow-gauge connection with Cincinnati.

*Cleveland, Tuscarawas Valley & Wheeling.*—An extension of this road was completed in April from Uhrichsville, O., southeastward 57 miles to the Ohio River at Bridgeport, opposite Wheeling, making the road 158 miles long from Lake Erie at Black River (about 30 miles west of Cleveland) southeastward.

*Columbus & Hocking Valley.*—The *Monday Creek Branch*, which at the beginning of the year extended from the main line at Nelsonville 12½ miles to Carbon Hill, was extended in 1880, 6 miles further to a junction with the Straitsville Branch at Oreville.

*Connotton Northern.*—This extension of the *Connotton Valley* road was completed from Canton, Ohio, northward 20 miles to Mogadore, and the grading was done for 23 miles further toward Cleveland, to Twinsburg. Gauge, 3 ft.

*Connotton Valley.*—This road, which was formerly the *Carrollton & Oneida*, in 1872 became the Ohio & Toledo, and in 1878 the Youngstown & Connotton Valley, at the beginning of the year extended from Dell Roy, O., northward 19 miles to the Tuscarawas Branch of the Cleveland & Pittsburgh at Oneida. In 1880 it was extended northwestward 22 miles, to the Pittsburgh, Fort Wayne & Chicago road at Canton, whence it is continued by the Connotton Northern.

*Dayton & Southeastern.*—Extended from Richmond Dale, O., southeastward 23 miles to the Portsmouth Branch of the Marietta & Cincinnati at Wellston, of which 15½ miles is new road, the track of the Marietta & Cincinnati (with a third rail) being used for the 7½ miles from Baker Junction to Byer's Junction, which latter point is 11 miles from Wellston. This makes the line worked 115 miles long, from Dayton southeast. Gauge, 3 ft.

*Lake Erie & Western.*—In December an extension was completed from the late eastern terminus at Fremont, O., east by north 24 miles to Sandusky, giving it a lake terminus, and making the road 378 miles long, from Sandusky west by south to Bloomington, Ill.

*McComb, Deshler & Toledo.*—Completed about the 1st of December from the Dayton & Michigan and the Baltimore & Ohio Railroad at Deshler, O., southeast 9 miles to McComb. It will be worked as a branch of the Dayton & Michigan.

*Mt. Gilead.*—Completed from the Cleveland, Columbus, Cincinnati & Indianapolis at Gilead station eastward 4 miles to Mt. Gilead, O.

*Ohio Central.*—This company during the year completed a line of road 147 miles long, from Toledo southeast to Bush's, a station where it joins a line completed last year by the *Columbus & Sunday Creek Valley* Company, but now owned by the Ohio Central, from Columbus east and southeast 65 miles to Corning, in the Hocking Valley, which latter was extended in 1880 from Corning, 20 miles, to Shawnee. The two roads were built chiefly to carry coal and iron from the Hocking Valley to Columbus and Toledo.

*Ohio & West Virginia.*—This road was completed in November from a junction with the Columbus & Hocking Valley at Logan, O. (50 miles southeast of Columbus), south by east 65 miles, to the Ohio River at Gallipolis, and thence north by east 19 miles to Pomeroy, making a line 84 miles long. It was built in the interest of the Columbus & Hock-

ing Valley Company, chiefly to serve the coal and iron industries of the Hocking valley.

*Toledo, Delphos & Burlington.*—At the north end this road was completed by laying the track from Waterville (15 miles south of Toledo) south by west 27½ miles to Holgate.

The *Southern Division* was extended from Mercer, O. (32 miles southwest of Delphos) south 7 miles to Celina, on the way to meet the Dayton, Covington & Toledo line.

The *Dayton, Covington & Toledo*, which has been united with the above road, was extended from Covington northward 10½ miles to Versailles, making it 36 miles long from its junction with the Dayton & Union at Stillwater Junction, over which latter road (by a third rail) its trains run to Dayton. Gauge, 3 ft.

Of the 28 miles of the *Detroit, Butler & St. Louis* road from Butler, Ind., northeast, 22 miles are in Ohio.

## MICHIGAN.

*Chicago & Northwestern.*—The *Menominee River* line was extended from Quinnesec, Mich., westward 17.29 miles to Florence, Wis., to iron mines, making the branch 42 miles long from its junction with the Peninsula Division 23 miles west of Escanaba. Of the extension 9½ miles are in Wisconsin, the rest in Michigan.

*Chicago & West Michigan.*—The *Hart Branch* was completed from Mear's (8 miles south of Pentwater), east by north 3½ miles to Hart.

*Detroit, Butler & St. Louis.*—Completed on the eastern end from Detroit, Mich., southwest 57 miles to Adrian. It will connect the Eel River line of the Wabash with Detroit, and serve as the Detroit outlet of the Wabash system.

*Detroit, Lansing & Northern.*—The *Stanton Branch* was extended from Mecosta, Michigan, westward 15 miles to the junction of the Grand Rapids & Indiana and the Big Rapids Branch of the Chicago & West Michigan at Big Rapids, making the whole branch 64 miles long from the junction four miles north of Ionia.

*Detroit, Mackinac & Marquette.*—On this road from the Straits of Mackinac to Marquette track was laid from Marquette eastward 25 miles, and from the Straits at Point St. Ignace northwestward 35 miles, leaving about 90 miles to be constructed to complete the road.

*Flint & Pere Marquette.*—The *Round Lake Branch* was completed from the main line at Butler Junction, Mich. (15 miles east of Ludington), northward 4 miles to Webber.

The *Clare County Branch*, which, at the beginning of the year, extended from Harrison Junction (formerly Budd's Lake Junction) north 9 miles, in 1880 was extended 6 miles further to Harrison, on Budd's Lake.

*Michigan Air Line.*—This road was extended during the year from the former western terminus at Rochester, Mich., west by south 10 miles to Pontiac, making it 36 miles long from its junction with the Grand Trunk at Ridgeway. Five miles more of this road, from Shelby to Rochester, built in 1878, has not been chronicled before. The road is now worked by the Grand Trunk.

*Port Huron & Northwestern.*—The main line was extended from Crosswell, Mich., northward 44½ miles to Sand Beach, making it 70 miles long from Port Huron north. On the *Marlette Branch* track was laid from Balmer's on the main line 13 miles from Port Huron, northwestward 33½ miles to Marlette; while an extension 1½ miles long was made in the city of Port Huron, making 79½ miles of new road. Gauge, 3 ft.

*St. Joseph Valley.*—On this road, which is to extend from the Michigan Central at Buchanan, Mich., north 10 miles to Berrien Springs, track was laid in December for 2 miles out of Buchanan.

*Tawas & Bay County.*—This road, late the *Lake Huron & Southwestern*, was extended from its former terminus at Camp Watson southwestward 11 miles, making it 24 miles long from Tawas City. Gauge, 3 ft.

## INDIANA.

*Chicago & Grand Trunk.*—Completed in January by the laying of 15½ miles of track from near Valparaiso, Ind., northwestward to the section built in 1879. This makes the road 232 miles long from Port Huron, Mich., to Chicago, for 21 miles of which on the Chicago end it uses the tracks of other roads.

*Indianapolis, Decatur & Springfield.*—Completed Jan. 29 by the laying of 11 miles of track on the Indianapolis end, making the road 152 miles long, from Indianapolis west to Decatur, Ill.

*Indianapolis, Delphi & Chicago.*—At the beginning of the year this company had a 3 ft. gauge road from Rensselaer, Ind., southeast 38½ miles to Delphi. In 1880 track was laid on an extension from Rensselaer northwest to the Joliet Division of the Michigan Central, from Dyer on the Illinois line southeast 17 miles to the town of Lowell, leaving a gap nearly ready for the rails of 21 miles to complete the road from Rensselaer to Dyer. A further extension in Illinois from Dyer northwest 5½ miles to the Chicago and Eastern Illinois at Glenwood, 24 miles south of Chicago, is to be made, and from Delphi to Indianapolis, 65 miles. The part built in 1880 is of standard gauge, and when the line is completed the old road is to be changed to the standard, and it will soon be reorganized as the *Chicago & Indianapolis Air Line*.

*Lake Erie, Evansville & Southwestern.*—This road, which was opened in 1873 from Evansville, Ind., northeast to Booneville 17½ miles, was extended in 1880 16 miles further east by north, to a junction with the Cincinnati, Rockport & Southwestern at Grigsby. The extension was built by the Evansville Local Trade Company, which now controls the road.

*Peoria, Decatur & Evansville.*—On the southern end this road was completed from Evansville, Ind., northwest 18 miles to Poseyville, and the grading completed 16 miles further, to the Wabash River.



**Toledo Delphos & Burlington.**—Extended from Warren, Ind., southwestward 44 miles to Kokomo, making the road 181 miles long, from Toledo southwestward. Gauge, 3 ft.

**Vernon, Greensburg & Rushville.**—This road was built in 1880 from a junction with the Cincinnati, Indianapolis, St. Louis & Chicago at Greensburg, Ind., south by west 20 miles to Brewersville, leaving five miles of track to be laid to complete it to Vernon, where it will connect with the Jeffersonville, Madison & Indianapolis and the Ohio & Mississippi.

Besides the above, 31 miles of the *Springfield, Effingham & Southeastern Railroad*, given under Illinois, are in Indiana and 6 miles of the *Detroit, Butler & St. Louis*, from Butler northeast.

## ILLINOIS.

**Chicago & Eastern Illinois.**—The *Grape Creek Branch* was completed from the main line at Danville, Ill., southwest 6½ miles to Grape Creek.

**Chicago & Western Indiana.**—This road, mainly completed in 1879, through legal difficulties was prevented from laying its track to the stations at its northern terminus at Twelfth street, in Chicago, until November, 1880, and that year laid about 1 mile of road.

Through the *South Chicago & Western Indiana* a branch was built from South Chicago Junction (8 miles south of Chicago) east 6.1 miles to Irondale, where there are great iron works.

**Chicago, Milwaukee & St. Paul.**—The *Chicago & Pacific Division* was extended from its old terminus at Byron, Ill., westward 27.68 miles to a junction with the Racine & Southwestern Division, five miles northeast of Lanark, making the division 116 miles long, and completing a road owned by this company from Chicago west to the Mississippi at Savanna, 139 miles long, and one to Rock Island, 194 miles long.

The *Libertyville Branch* was completed from Libertyville, Ill., east 3 miles to the Chicago Division.

**Danville & Southwestern.**—This road was extended early in the year from its former southern terminus at Lawrenceville, Ill. (9 miles west of Vincennes on the Ohio & Mississippi) south 10 miles to a junction with the Cairo & Vincennes at St. Francisville, which is 10 miles southwest of Vincennes. It was opened in April, but is used only for freight trains, the passenger trains of the Danville & Southwestern running into Vincennes over the Ohio & Mississippi.

**Danville, Olney & Ohio River.**—Extended from Westfield, Ill., southward 41½ miles to a point within 2½ miles of the Peoria, Decatur & Evansville road at West Liberty, making the road 48½ miles long from the Indianapolis & St. Louis road at Kansas south. Gauge, 3 ft.

**Fulton County.**—Completed from the Illinois River at West Havana, Ill., northwestward 39 miles through Lewistown and Cuba to Fairview. Gauge, 3 ft.

**Illinois Central.**—The *Kankakee & Southwestern* road was extended from Anchor, Ill., southwestward 4.44 miles to Colfax, making the whole length 61 miles from the Chicago Division to Otto. The branch of this line built by the *Kankakee & Western* Company was extended from the 1879 terminus due west 29.8 miles to a junction with the North Division at Kankakee Junction, a little south of Minonk and 10 miles north of El Paso, making it 42 miles long from Kempton Junction west. This is 34½ miles of new road.

**Jacksonville & Southeastern.**—Extended from the old terminus at Virden, Ill., south by east 23.2 miles to a junction with the Wabash and the Indianapolis & St. Louis at Litchfield, making the road 55 miles from Jacksonville southeastward. It was completed about the end of November.

**Peoria, Decatur & Evansville.**—This road, formed during the year by the consolidation of the Pekin, Lincoln & Decatur and the Grayville & Mattoon, was extended from Parkersburg, Ill., south 23 miles, to a point within two miles of Grayville, and from Grayville southeast two miles to the Wabash River, on the way to Evansville, making the line 216 miles long, from Peoria southeast. There remain about 18 miles of track to be laid to bring it to the Indiana completed section of the road, when it will be 250 miles long.

**St. Louis Coal & Railroad.**—This company during the year leased the *Carbondale & Shawneetown Railroad* for a term of years and extended it from Carbondale westward 9½ miles to Harrison, making the line 27¼ miles long, from Marion, west.

**Tuscola, Charleston & Vincennes.**—On this line, which is to extend from Charleston, Ill., northward, 1 mile of track was laid out of Charleston just before the year closed. Gauge, 3 ft.

**Wabash, St. Louis & Pacific.**—The *Chicago & Strawn Railroad* was completed for this company between Chicago and Strawn, by the laying of 45 miles of track, making the whole length of the Chicago & Strawn proper 92.2 miles, from its junction with the Chicago & Western Indiana (over which it enters Chicago), at Auburn Junction, 8 miles south of Chicago, southwestward to the junction with the Chicago & Paducah (also belonging to the Wabash) a mile north of Strawn.

This gives the Wabash through lines from Chicago as follows: To Burlington, Iowa, 261 miles; to Keokuk, 270 miles; to St. Louis, 286 miles; to Kansas City, 513 miles.

**Springfield, Effingham & Southeastern.**—Completed from the western terminus of another narrow-gauge road, the Bedford, Springfield, Owensboro & Bloomfield, at Switz City, Ind., westward 91 miles to Effingham, Ill. Gauge, 3 ft. About 31 miles are in Indiana.

## WISCONSIN.

**Chicago & Northwestern.**—The company built 8½ miles of 3 ft. gauge railroad to connect the Chicago & Tomah and the Galena & Wisconsin roads, which it had bought, and has now united under the name of the *Milwaukee & Madison*.

**Railway.** This new section extends from a point half a mile south of Rewy, Wis., to a point 3½ miles south of Montfort, and completed a line 76 miles long from Galena, Ill., north to Woodman, Wis.

The track was laid on the line of the *Milwaukee & Madison*, which is to give this line an eastern outlet, from Madison, Wis., westward 9½ miles to Verona, of standard gauge. The latter had not been opened to business at the close of the year.

The Wisconsin Division was connected with the Madison Division by building a line 6.1 miles long from Janesville southward to Afton, through the *Rock River Railway Company*.

Of the extension of the *Menominee River Railway* from Quinnesec west to Florence 9.81 miles are in Wisconsin.

**Chicago, Milwaukee & St. Paul.**—The *Beloit Branch* was completed from the Monroe Branch at Janesville, Wis., southward 13.96 miles to the Southwestern Division at Beloit. The *Albany Branch* was completed from the Monroe Branch at Brodhead northwest to Albany, Wis., 7.15 miles.

**Chicago, St. Paul, Minneapolis & Omaha.**—At Eau Claire, Wis., a branch 2¼ miles long was completed to saw mills, intended wholly to serve these mills; at Menominee a similar branch for the same purpose, 3¼ miles long, was completed.

**Chicago, St. Paul, Minneapolis & Omaha.**—The *Northern Division* (late the North Wisconsin Railroad) was extended from a point 7½ miles north of Granite Lake, Wis., northward 53½ miles to Cable, making the road 122½ miles long, from the junction near Hudson northward.

**Fond du Lac, Amboy & Peoria.**—Extended northward 1 mile, making it 81 miles long, from Fond du Lac to Iron Ridge. Gauge, 3 ft.

**Milwaukee, Lake Shore & Western.**—The main line was extended from a point one mile north of Tigerton, Wis., northwestward 34½ miles to Wausau, making it 210 miles long from Milwaukee; the *Aniwa Branch* was built from Eland Junction 30 miles east of Wausau, north 11 miles to Aniwa, and the *Oshkosh Branch* was finished by laying 10½ miles of track, to Oshkosh, making it 22 miles long from its junction with the main line.

**Wisconsin & Minnesota.**—This road, built in the interest of the Wisconsin Central, was completed in November from its junction with the latter road at Abbotsford, Wis., (219 miles from Milwaukee) west 54 miles to Chippewa Falls, where through the Chippewa Falls & Western and the Chicago, St. Paul, Minneapolis & Omaha Railroad, it will be connected with St. Paul and open a new route thence to Lake Michigan.

**Wisconsin Central.**—A branch 2½ miles long was completed from Menasha Junction to Appleton, Wis.

## MINNESOTA.

**Chicago, Milwaukee & St. Paul.**—The *Benton Branch* of the Hastings & Dakota Division was completed from that line at Benton, Minn. (56 miles west of Hastings), northeast 28.9 miles to Minneapolis.

**Chicago, St. Paul, Minneapolis & Omaha.**—A spur was built from Hudson Bridge north 2¼ miles to South Stillwater, Minn.

The *Blue Earth City Division* was extended from Blue Earth City, Minn., southward 10 miles to the Iowa line, where it is to meet the line of the Chicago & Northwestern from Des Moines north.

**St. Paul & Duluth.**—The *Taylor's Falls & Lake Superior Branch* was completed from a junction with the main line at Wyoming, Minn. (30 miles north of St. Paul), east by north 21 miles to Taylor's Falls. It is owned and used jointly with the Minneapolis & St. Louis Company.

The *Knife Falls Branch* was extended 1 mile.

**St. Paul, Minneapolis & Manitoba.**—The *Grand Forks, Moorhead & Barnesville Branch* was completed from a junction with the Breckenridge, Fergus Falls and St. Vincent divisions at Barnesville, Minn. (16 miles south of the Northern Pacific crossing at Glyndon) northwest to the Northern Pacific and the Red River at Moorhead, 22½ miles.

The *Morris & Brown's Valley Branch* was completed from a junction with the Breckenridge Division at Morris, Minn., west 47½ miles to the Dakota line at Brown's Valley at the north end of Big Stone Lake.

**Chicago & Northwestern.**—On the *Dakota Central* line the track was extended from Volga, Dak., near the Sioux River, westward 184½ miles to the Missouri River at Pierre, opposite Fort Pierre and 170 miles east of Deadwood. The whole length of the line from the junction with the Winona & St. Peter at Tracy, Minn., is 255½ miles, and Pierre is 780 miles from Chicago.

## DAKOTA.

**Chicago, Milwaukee & St. Paul.**—The *Iowa & Dakota Division* was extended from the 1879 terminus at Bridge-water, Dak. (15 miles west of Marion Junction), westward 81.57 miles, making the terminus of the division 193 miles from the Iowa line and 386 miles from its junction with the Iowa & Minnesota Division at Calmar.

The *Southern Minnesota Division* was extended from Flandreau, Dak., west 28.2 miles to Madison, making the division 339 miles long from La Crosse westward.

The *Sioux Falls* line of the Sioux City & Dakota Division was extended from Sioux Falls north 13.12 miles to Dell Rapids, and the *Elk Point Cut-off* was completed from this line at Westport southwest to the Yankton line at Elk Point, 4.65 miles.

The *Hastings & Dakota Division* was extended from the Minnesota line at Ortonville westward 78 miles, and a branch of the same division was completed from Milbank Junction (12 miles west of Ortonville) northwest 23 miles.

**Chicago, St. Paul, Minneapolis & Omaha.**—The *Worthington & Sioux Falls Branch* was extended

from Sioux Falls, Dak., west by north 37 miles to within two miles of Salem, the county seat of Cook County, making it 100 miles long from its junction with the main line at Worthington.

**Northern Pacific.**—The Missouri Division of the main line was extended from the 1879 terminus 55 miles west of the Missouri River westward 182 miles to Beaver Creek, in Montana, eight miles of which are in Montana. This makes the main line 641 miles long, from Duluth west.

The *Casselton Branch* was completed from the main line at Casselton (20 miles west of the Red River) due north 31 miles to Blanchard.

**St. Paul, Minneapolis & Manitoba.**—The *Grand Forks, Moorhead & Barnesville* line was completed from the main line at Barnesville, Minn. (16 miles south of the Northern Pacific crossing at Glyndon), northwest to the Red River at Moorhead, 23 miles (in Minnesota), and on the other side of Red River from the Northern Pacific at Fargo north 38 miles down Red River, and also from a junction with the Red River Valley Branch at Grand Forks Junction south up the river 24 miles, leaving a gap of about 16 miles to be filled to complete parallel lines on both sides of Red River.

The *Red River Valley Branch* was extended from the Red River at Grand Forks westward 12 miles, to Ojata, making it 37 miles long from the junction near Crookston.

The *Red River & Northern* was completed from Breckenridge northwest 48 miles, toward the Northern Pacific at Casselton.

## IOWA.

**Burlington & Northwestern.**—Extended in January from Crawfordsville, Ia., northwestward 10 miles to Washington, making the road 36 miles long from its junction with the Burlington, Cedar Rapids & Northern at Mediapolis, and 52 miles from Burlington, to which place it uses the Cedar Rapids road's track, with a third rail. Gauge, 3 ft.

**Burlington, Cedar Rapids & Northern.**—The *Pacific Division* was extended from Holland, Iowa (to which it was completed in 1878), northwest 55 miles to Clarion, Iowa, making the branch 103½ miles long, from its junction with the main line at Vinton.

The *Muscatine Division* was extended from Thornburg (4½ miles north of the old terminus at What Cheer) northwestward 16 miles to Montezuma, making the division 92½ miles long from Muscatine westward.

**Chicago & Northwestern.**—The *Toledo & Northwestern* road was extended from Garwin, Iowa, westward 57.39 miles to Jewell Junction, and thence northwestward 26.6 miles to a point 12 miles beyond Webster City. The 12 miles north of Webster City had not been opened for traffic at the close of the year. This line is to be extended north to the Minnesota line, where it will meet the Blue Earth Division of the Chicago, St. Paul, Minneapolis & Omaha.

**Chicago, Burlington & Quincy.**—The *Bethany Branch* was completed from a junction with the Mount Ayr Branch at Bethany Junction, Iowa, nearly due south 28.59 miles to Bethany, Mo., of which three miles are in Iowa.

The *Mt. Ayr Branch* was extended from the former terminus at Mt. Ayr, Iowa, southwest and south 22½ miles to Grant City, Mo. Fourteen miles of it are in Iowa.

The *Hastings Branch* was completed from Hastings, Iowa (35 miles east of Council Bluffs), northward 15.73 miles to Carson City, where it meets a branch of the Rock Island road from the north.

The *Red Oak & Atlantic Branch*, whose terminus at the beginning of 1880 was 15½ miles north of Red Oak, was extended 2½ miles to Griswold.

**Chicago, Milwaukee & St. Paul.**—A cut-off line was completed from the Iowa & Dakota Division at Rock Valley, Iowa, southwest 9.39 miles to the Sioux City & Dakota Division at Eden.

The *Dubuque Division* (late Chicago, Clinton, Dubuque & Minnesota Railroad) was extended from Midland Junction southward 8 miles to Clinton, Iowa, where formerly the track of the Chicago & Northwestern was used.

The *Davenport Line* was extended from its former terminus at Fayette, Iowa, northwestward 25 miles to a connection with the Iowa & Dakota Division at Jackson Junction, 12 miles southeast of Calmar, making the line 153 miles long, from Davenport northwestward.

**Chicago, Rock Island & Pacific.**—This company completed a branch late in the year from the main line at Avoca, Iowa (41 miles east of Council Bluffs), southward 17¾ miles to Carson, where it meets a branch of the Chicago, Burlington & Quincy from Hastings north.

The *Keosauqua Branch* was completed from the Keokuk & Des Moines Division at Mt. Zion, Iowa, southwest 4½ miles to Keosauqua, partly on the line of an abandoned narrow-gauge road.

About the end of August the *Griswold Branch* was completed from Atlantic, Iowa (60 miles east of Council Bluffs), south by west 14 miles to Griswold, where it meets a branch of the Chicago, Burlington & Quincy from Red Oak.

The *Guthrie Branch* was completed from Guthrie, Iowa (97 miles east of Council Bluffs), north by west 13.7 miles to Guthrie Centre.

**Dubuque & Dakota.**—Extended from the former eastern terminus at Waverly, Iowa, eastward 23 miles to Sumner, making the road 64 miles long, from Sumner westward to Hampton.

**Keokuk & Northwestern.**—Completed from Keokuk, Iowa, north by west 37 miles to Salem.

**Minneapolis & St. Louis.**—Completed in June by the construction of 40 miles of road from Forest City, Iowa, southwest to Livermore, where it is continued by the leased Fort Dodge & Fort Ridgely road to Fort Dodge, making a line 210 miles long from Minneapolis southwest to Fort Dodge.



The Coal Branch was completed from near Fort Dodge south 8 miles to coal mines.

**Wabash, St. Louis & Pacific.**—The Missouri, Iowa & Nebraska Railroad, which this company has acquired, was extended from Corydon, Iowa, westward 30 miles to Van Wert, the 17 miles of it west of Humeston being built jointly by the Wabash and the Chicago, Burlington & Quincy.

A branch of the above line was completed in July from Centerville, Iowa, northward 26 miles to the southern terminus of the Central Iowa at Albia.

## NEBRASKA.

**Burlington & Missouri River in Nebraska.**—This company, which still exists, though the property of the Chicago, Burlington & Quincy by the latter company's purchasing all its stock, extended its *Republican Valley Division* from the 1879 terminus at Bloomington, Neb., west 78.6 miles to Indianola, and also from Amboy, the point where this division turns from south to west, eastward 75 miles. Of this latter 6 miles between Hardy and Harbine and 4 miles a little east of Chester are just across the line in Kansas. Also on what will be the eastern end of this division 15 miles of track were laid from Beatrice south and west, leaving but a short gap to be filled.

The *Nebraska Railway Division*, was extended from the 1879 terminus at Aurora, Neb., north (at right angles with its previous course) 19 miles to a junction with the Union Pacific at Central City, making the line 150½ miles long from the Missouri at Nebraska City.

The *Atchison & Nebraska Division* was completed by extending the section built by the *Lincoln & Northwestern* company from a point 50 miles from Lincoln northwest 24 miles to the Union Pacific, at Columbus, making it 220½ miles long from Atchison northwestward.

**Chicago, St. Paul, Minneapolis & Omaha.**—The *Omaha Division* was completed in November by the construction of a line from Coburn, 10 miles west of the Missouri River, southwestward and southeastward 53 miles to Oakland, on the old Omaha & Northern Nebraska road (which this company has bought), whence the distance to Omaha is 62 miles, thus making a line 125 miles long from Covington (opposite Sioux City) to Omaha, and completing a line owned by this company from St. Paul southwest to Omaha 395 miles long, and from its eastern terminus at Elroy, Wis., to Omaha 592 miles.

The entire line of 26 miles of the Covington, Columbus & Black Hills was reconstructed and changed from 3½ ft. to standard gauge; but this adds nothing to the miles laid in the state and country, though it does to the miles worked, for this road had not been worked for some years.

A branch of the Omaha line from Emerson Junction (27 miles southwest of Covington) has been graded southwestward 47 miles to a junction with the Sioux City & Pacific and a branch of the Union Pacific at Norfolk.

**Sioux City & Pacific.**—This company's leased *Fremont, Elkhorn & Missouri Valley* road was extended west by north 14.2 miles from Oakdale, Neb., to Clearwater, making it 123 miles long from the Union Pacific at Fremont, and 144 miles from the Missouri River at Blair.

The *North Branch* of the same was completed from Norfolk Junction (79 miles from Fremont) northwestward 31.7 miles to Plainview.

**Union Pacific.**—Through the *Omaha & Republican Valley Company* the Union Pacific completed early in the year a branch from Valparaiso, Neb. (73 miles from Omaha), south 20.3 miles to Lincoln; and also (isolated from any other part of the Omaha & Republican Valley) early in the year a branch of the Union Pacific main line from Grand Island (154 miles west of Omaha) north by west 21.9 miles to St. Paul.

Through the *Omaha, Niobrara & Black Hills Company* it completed early in the year a branch of the *Duncan-Norfolk Branch*, from Lost Creek (7 miles north of the junction with the main line at Duncan) northwest 34.4 miles to Albion. This is altogether 76.6 miles of new road.

## MISSOURI.

**Kansas City, Fort Scott & Gulf.**—This company constructed the following lines: The *Rich Hill Railroad* from the main line five miles south of Pleasanton, Kan. (and 79 miles south of Kansas City), east 30 miles to a point one mile east of Rich Hill, Mo., and from that point one spur south 4 miles to Carbon Centre and another north 3 miles to Spencer's coal banks, making 27 miles. Of this 4½ miles are in Kansas.

The *Fort Scott, Southeastern & Memphis* road was extended from Arcadia, Kan. (formerly Findlay), southwestward 36 miles (two miles in Kansas) to Golden City, Mo., making it 49 miles long from its junction with the main line four miles south of Fort Scott, and leaving but 15 miles to be laid to connect it with the

*Springfield & Western Missouri*, which the Kansas City Company leased during the year and extended for 1 mile through the town of Springfield, and (opened in May) from Ash Grove west by north 19 miles to Greenfield.

**Missouri Pacific.**—The *Lexington & Southern Division* was completed from a junction with the main line at Pleasant Hill (33 miles southwest of Kansas City) south 68 miles to a connection with the Missouri, Kansas & Texas at Nevada. This line is chiefly over a road-bed graded several years ago by the Lexington, Lake & Gulf Company.

The leased *Osage Valley & Southern Kansas* road, which extended from the main line at Tipton north to the Missouri River, and is known as the *Boonville Branch*, was extended southward from Tipton to Versailles, 18 miles.

**Quincy, Missouri & Pacific.**—Extended from Novinger, Mo., westward 27 miles to Milan, on the Burlington & Southwestern, making the road 108½ miles long from the Mississippi at West Quincy westward.

**St. Louis & San Francisco.**—The *Arkansas Division* was completed from the main line at Plymouth, Mo., south 32 miles to Seligman, close to the Arkansas line.

**St. Louis, Salem & Little Rock.**—During the year the following branches were built from this road to iron mines by the owners of the mines: From Salem, Mo., south-east 7 miles to the *Riverside* mines; from a junction with the Dent & Phelps Branch, near Smith mine, northwest 4 miles to the *Stimson* iron bank, and from Sligo 4 miles to Sligo Furnace.

**Sedalia, Warsaw & Southern.**—Track was laid from the junction with the Missouri Pacific at Sedalia, Mo., southward 42 miles to Warsaw. Gauge, 8 ft.

## KANSAS.

**Atchison, Topeka & Santa Fe.**—The *Manhattan, Alma & Burlingame Branch* was completed from a junction with the main line at Burlingame, Kan., 76 miles southwest from Atchison and 26 from Topeka, northwestward 56½ miles to the Kansas Pacific at Manhattan. It is, we believe, in the interest of the Atchison road and the Kansas Pacific jointly.

**Atchison, Topeka & Santa Fe.**—The *Marion & McPherson Branch* was extended in the first half of the year from McPherson, Kan., west 30 miles to Lyons, making the branch 77 miles long from the junction at Florence, and nearly completing a loop of the main line, Lyons being within ten miles of that line. The branch called last year the *Wellington Branch* of the *Cowley, Sumner & Fort Smith* road was extended from Wellington, Kan., southwest 21 miles to the Indian Territory border at Caldwell, making it 38 miles long from the junction at Mulvane.

Under the charter of the *Wellington & Western Company* a line was begun from the Caldwell Branch, at a point three miles southwest of Wellington, due west, parallel with and only about two miles south of the extension of the *Southern Kansas* line of the Kansas City, Lawrence & Southern. This was graded about 30 miles and track was laid from the junction west 14 miles to a point just beyond the *Chickaskia* River. Late in the year an arrangement was made for a combination of the two companies, and when this is completed this road will be abandoned and the track taken up.

**Kansas Central.**—Extended from a point 101 miles west of Leavenworth, Kan., westward 18 miles to Garrison, making the road 119 miles long from Leavenworth westward. Gauge, 3 ft.

**Kansas City, Ft. Scott & Gulf.**—The narrow-gauge *Memphis, Kansas & Colorado* road, a leased line, was extended from Parsons, Kan., westward 19 miles to Cherryvale, but on the other end the track from Weir City, Kan., southeast to Messer, 11 miles, has been taken up, leaving this road 50 miles long, from Weir City (5 miles east of the main line of the Ft. Scott road) nearly due west 50 miles to Cherryvale. Two miles of the extension of this company's *Ft. Scott & Southeastern* and 4½ of its *Rich Hill* line are in Kansas.

**Kansas City, Lawrence & Southern.**—The *Southern Kansas* was extended from its 1879 terminus westward 82 miles to Harper, Kan., making the line 147 miles long from the junction with the north-and-south section of the road at Cherryvale, and 272 miles from the northern terminus of the road at Lawrence.

The *Sumner County Branch* was completed from the above line at Wellington (35 miles east of Harper) due south 18 miles to Hunnewell, on the Indian Territory line.

**Missouri Pacific.**—The *Ottawa Branch* of the Kansas & Arizona Division (late St. Louis, Kansas & Arizona Railroad) was completed early in the year from the junction at Osawatimie, Kan., northwestward 21 miles to the Kansas City, Lawrence & Southern at Ottawa.

**St. Louis & San Francisco.**—The main line was extended from the 1879 terminus 1½ miles east of Severy, Kan., westward 67½ miles to a junction with the Arkansas Branch of the Atchison, Topeka & Santa Fe at Wichita.

## COLORADO.

**Atchison, Topeka & Santa Fe.**—Under the charter of the *Pueblo & Arkansas Valley Company* a line was built from Pueblo, Col., west by north 37 miles, to the company's coal mines at Coal Banks, near Cañon City.

**Denver & Rio Grande.**—July 5 the *Leadville Division* was completed to Leadville, making 104½ miles of track laid in 1880, from the terminus of the track laid the year before from Pueblo northwest 54 miles by the Atchison, Topeka & Santa Fe Company and turned over to the Denver & Rio Grande in settlement of differences. This makes the division 158½ miles long, from South Pueblo up the Arkansas River to Leadville.

The *Alpine Branch* of this division was completed from a junction two miles west of Nathrop southeastward 11½ miles to Alpine.

The *Silver Cliff Branch* of the same division was completed from a junction near Cañon City southward 5 miles, and was graded about 20 miles further.

The *Gunnison Division* was completed from the same division at South Arkansas southwestward 5½ miles to Poncho Springs.

The *Eagle River Extension* of the same division (built by another but affiliated corporation, whose name we cannot give) had the track laid from Leadville northwest 10 miles.

The *Leadville, Ten Mile & Breckenridge Company*, also an affiliated corporation, completed another extension of the same division from Leadville northward 19 miles to Kokomo.

The *Manitou Branch* was completed, from the main line at Colorado Springs (75 miles south of Denver), west by north 5.8 miles to Manitou.

The *San Juan Division* was extended from Alamosa, Col.,

southwest 29 miles to Antonito (late San Antonio), and thence west 51 miles to Alta. At first its direction is southwest from Antonito, six miles from which there is a bend nearly six miles long in New Mexico, and five miles beyond this another bend about four miles long in the same territory.

Of the 91 miles of the *New Mexico Division*, given under New Mexico, 5 miles, from Antonito south to the border, are in Colorado. Gauge, 3 ft.

**Denver, South Park & Pacific.**—Completed March 1 from a point 116 miles from Denver, Col., southwestward 19 miles to a junction with the Denver & Rio Grande at Buena Vista, over 37 miles of which latter road its trains reach Leadville, and over eight miles of it its Gunnison extension.

Later in the year the *Gunnison Extension* was completed from the Denver & Rio Grande at Nathrop, eight miles southeast of Buena Vista, westward 5 miles. Gauge, 3 ft.

**Union Pacific.**—The *Julesburg Branch* was completed from the main line at Denver Junction (5 miles east of Julesburg), which is 372 miles from Omaha and 144 miles east of Cheyenne, southwestward up the South Platte 50½ miles to Riverside.

## NEW MEXICO.

**Atchison, Topeka & Santa Fe.**—Through the *New Mexico & Southern Pacific Company* the main line was extended from a point 59½ miles south of Las Vegas, New Mexico, southward down the Rio Grande 176½ miles to San Marcial, and through the *Rio Grande, Mexico & Southern Pacific Company* from San Marcial 74.6 miles further south to Rincon, making an extension of 251.35 miles.

Early in the year the *Santa Fe Branch* was completed from Lamy northward 18½ miles to Santa Fe.

**Atlantic & Pacific.**—On this road, which is to be used jointly by the Atchison, Topeka & Santa Fe and the St. Louis & San Francisco as their connection with California, track has been laid from a junction with the former road at Isleta, near Albuquerque, New Mexico, westward 78 miles toward Fort Wingate.

**Denver & Rio Grande.**—The *New Mexico Division* was completed from its junction with the San Juan Division at Antonito (159 miles south of Denver) southward 91 miles to Espanola (near Santa Cruz), 28 miles north of Santa Fe which, under the agreement with the Atchison, Topeka & Santa Fe, is to be the permanent southern terminus. Five miles of this division, from Antonito south, are in Colorado. Gauge, 3 ft. This makes 332 miles of railroad laid by this company in 1880.

**Southern Pacific.**—Of the 295 miles of new road completed in 1880, 97 are in New Mexico.

## ARIZONA.

**Southern Pacific.**—Extended from Casa Grande, Arizona, southeast and east 295 miles to Deming, New Mexico, making the road 472½ miles long from Yuma east, and completing a line 1,308 miles long from San Francisco. At Deming, or the next station west, connection will be made with the Atchison, Topeka & Santa Fe from the north, and the distance thence to the Rio Grande and El Paso is considerable, and much work has been done on it. Of the extension, 97 miles are in New Mexico.

## UTAH.

**Union Pacific.**—The *Summit County Railroad* was completed from Echo, Utah (41 miles east of Ogden), south 27.27 miles to Park City, and also the *Grass Lake Branch* of same, from Watson's, 3 miles southeast of Echo, northeast 3.95 miles. These are built to serve coal mines chiefly.

**Utah Eastern.**—This road was completed from the Summit County Railroad at Coalville, Utah, a few miles from the Union Pacific station at Echo, south by west 16 miles to Kimball, leaving 14 miles more to connect the road with the Wasatch & Jordan Valley road at Alta, in connection with which it will form a line 46 miles long from the Summit County coal mines southwest to Sandy, which is on the Utah Southern road 13 miles south of Salt Lake City.

**Utah Southern Extension.**—Extended from Deseret, Utah, southward 69 miles to Frisco, making it 122 miles long from its northern terminus at Juab, and in connection with the Utah Southern and the Utah Central completing a line 264 miles long from the Union Pacific, at Ogden, southward.

## MONTANA.

**Union Pacific.**—This company extended the Utah & Northern Railroad from the 1879 terminus on the Montana line northward 65½ miles to Dillon, Montana, making the road 350½ miles long from Ogden northward. Gauge, 3 ft.

Of the extension of the Missouri Division of the *Northern Pacific*, 8 miles, from the Dakota line to Beaver Creek, are in Montana.

## NEVADA.

**Carson & Colorado.**—Completed from a junction with the Virginia & Truckee at Mound House (about 10 miles northeast of Carson), Nev., eastward 21 miles. It is graded some miles further south to a point beyond Walker Lake, whence there is a toll road southwest to the Bodie mining district, just over the line, in California. The railroad is to be extended from Walker Lake southeastward to Candelaria.

**Nevada Central.**—Feb. 11, the track of this road was completed to Austin, Nev., 50 miles further than the 1879 terminus, making the road 90 miles long from its junction with the Central Pacific at Battle Mountain south. Gauge, 3 ft.

## CALIFORNIA.

**Southern Pacific.**—The *Monterey Branch* was completed from the *Northern Division*, at Castroville, Cal., 110 miles south of San Francisco, southwest and west 15 miles to the Pacific at Monterey, which is a California seaside resort. This takes the place, however, of the old Monterey & Salinas Valley road, from Monterey due east 18½ miles to Salinas, which is eight miles south of Castroville. This



road was bought at foreclosure sale, part of it rebuilt and the rest abandoned, so that there is now less and not more road on account of the new construction.

**South Pacific Coast.**—A gap of 2 miles between the southern section of the road and the northern, where there was some heavy tunnel work, was filled, completing a line owned by the company from Dumbarton Point, on the east side of San Francisco Bay, southward 79 miles to Santa Cruz. Gauge, 3 ft.

## OREGON.

**Oregon & California.**—A branch was constructed from a junction with the main line at Albany, Or. (81 miles south of Portland), southeastward 11½ miles to Lebanon in Linn County.

**Oregonian.**—This company bought the road built in 1878 as the Dayton, Sheridan & Grande Ronde and afterward as the *Willamette Valley*, consisting of a 3 ft. gauge line 27 miles long from Dayton to Dallas with a branch of 8 miles, all on the west side of the Willamette River. In 1880 it built an extension of this road from Dallas, 9 miles, to Smithfield, and an entirely new road on the east side of the Willamette from Ray's Ferry on the Willamette (30 miles south of Portland) southward 72 miles to Brownsville. Gauge, 3 ft.

**Oregon Railway & Navigation Co.**—At the beginning of the year this company, whose chief property then was steamboats plying on the Columbia River, owned two short pieces of railroad around rapids of the Columbia River, the upper one extending from the Dalles east 14½ miles to Celilo, and 168 miles above Celilo 46 miles of 3-ft. gauge road, consisting of a line from Wallula, Washington Territory, east 32 miles, with a branch south to Blue Mountain. In 1880 the company made an agreement with the Northern Pacific to construct a road south, of standard gauge, down the south bank of the Columbia, which should be used jointly by both companies, Wallula being about 12 miles south of Ainsworth, where the Northern Pacific's Pend d'Oreille Division begins. On this 108 miles of road 78 miles of track were laid in 1880, from Wallula west and from Celilo east, leaving a gap of 30 miles. Five miles, from Wallula southwest, are in Washington.

## WASHINGTON.

**Northern Pacific.**—The *Pend d'Oreille Division* was completed from the junction of the Snake and Columbia Rivers at Ainsworth, Wash. T., northward 45 miles, and graded 120 miles further. The *Columbia River Division* was completed from the Snake River, opposite Ainsworth, southward, down the left bank of the Columbia to Wallula, whence it is continued westward by the line built by the Oregon Railway and Navigation Company, which will be used by the two companies in common.

Of the extension of the *Oregon Railway & Navigation Co.'s* road from Wallula down the Columbia River (described under Oregon), 5 miles are in Washington.

## RAILROAD CONSTRUCTION IN 1880.

The following is a tabular statement of the information given above of the length, direction, termini and gauge of each section of new railroad in each state and territory in which track was laid during the year 1880:

MAINE.	
Old Orchard Beach (3 ft.), Old Orchard Beach to mouth of Saco River.....	3
VERMONT.	
Brattleboro & Whitehall (3 ft.), Brattleboro n. w. to Londonderry.....	36
MASSACHUSETTS.	
Massachusetts Central, between Hudson and Stoney Brook, Nantasket Beach, Point Allerton along beach.....	14
New Haven & Northampton, ex. Northampton n. to Bardwell's Ferry.....	3
Turner's Falls Branch, S. Deerfield n. e. ....	19½
.....	42½
CONNECTICUT.	
New York & New England, ex. Waterbury s. e. to N. Y. line.....	33¾
NEW YORK.	
Jerome Park, Harlem R.R. to Jerome Park.....	1
Long Branch, L. I. R.R. s. e. to Long Beach.....	6
Metropolitan Elevated, Chatham square n. to Harlem River.....	6¼
New York Central & Hudson River, ex. in Buffalo.....	1
New York, Woodhaven & Rockaway, Glendale Junction s. and e. to Rockaway.....	10¼
Tonawanda Valley (3 ft.), Attica s. by w. to Currier's Corners.....	19
Warwick Valley, ex. Warwick s. w. to N. J. line.....	4
.....	47½
NEW JERSEY.	
Central of New Jersey—	
Long Branch Division, ex. Sea Girt s. to Point Pleasant.....	3
Philadelphia & Atlantic City (3½ ft.)—	
Pleasantville & Ocean City Branch, Pleasantville to Somers' Point.....	7¼
Philadelphia, Marston & Meador, Haddonfield e. ....	1½
Warwick Valley, ex. N. Y. line s. w. to McAfee.....	7¼
Watchung, ex. to Main st., West Orange.....	½
West Jersey & Atlantic, Newfield e. by s. to Atlantic City.....	34½
.....	54½
PENNSYLVANIA.	
Bell's Gap (3 ft.), ex. Lloydsville n. w. to Utahville.....	12
Bradford, Bordell & Kinzua (3 ft.), Bradford to Bordell.....	13
Bordell to Smithport.....	11½
Branch Kinzua June, to Simpson (3 ft.).....	5
Emlenton, Shippensburg & Clarion (3 ft.), branch Pike's Siding n. to Arthur.....	3¼
Long Valley, Lamoka n. to Long Valley coal mines.....	7
Montour, ex. to Jeffreystown.....	9
Pennsylvania—	
Lewisburg & Tyrone, ex. Tyrone e. to Penna. Furnace.....	17
Pittsburgh, Virginia & Charleston, ex. Monongahela City s. to Belle Vernon.....	11
Southwest Penna., ex. Oliphant s. to Fairchance.....	2
Pittsburgh & Western (3 ft.), ex. Zelenople n. w. to Wurttemberg.....	10¾
Pittsburgh, Titusville & Buffalo—	
Oil City Branch, Oil City n. to Petroleum Centre.....	9
Sharpville, Gilkey Run Branch.....	1¼
Somerset & Cambria, Somerset n. by e. to Johnstown.....	37
Western Maryland—	
Baltimore & Cumberland Valley, ex. Md. line to Waynesboro.....	4½
Wilmingon & Northern—	
French Creek Branch, Springfield e. to Falls.....	6
.....	159¼

MARYLAND.	
George's Creek & Cumberland, Pa. R. R. in Md. s. w. to Lonaconing.....	19¼
Branch Midland June, to American Coal Co. mines.....	4¼
Shenandoah Valley, Shepherdstown n. to Hagerstown.....	17
.....	40¾
VIRGINIA.	
Charlottesville & Rapidan, Charlottesville n. by e. to Orange C. H.....	28¼
Franklin & Pittsylvania (3 ft.), Pittsville w. to Rocky Mount.....	29
Richmond & Allegheny, Richmond w.....	59
Williamson s.....	34
Shenandoah Valley, ex. Riverton s. by e. to Milford.....	16¼
do. Dyer, s. to Lowell.....	40¼
Waynesboro n. by e.....	207
NORTH CAROLINA.	
Cheraw & Salisbury (5 ft.), Wadesboro s. e. to S. C. line.....	15
Chester & Lenoir (3 ft.), Dallas n. to Catawba River.....	3½
Western North Carolina, ex. w. to Asheville depot.....	12
.....	30¼
SOUTH CAROLINA.	
Barnwell & Blackville, Blackville s. w. to Barnwell.....	13
Cheraw & Salisbury (5 ft.), Cheraw n. to N. C. Line.....	10
Cheraw & Chester (3 ft.), Catawba River e. to Lancaster.....	8
.....	31
GEORGIA.	
Atlanta & Charlotte Air Line—	
Lawrenceville Branch (3 ft.), Suwanee s.....	3½
Columbus & Rome (3 ft.), ex. n. to Hood.....	4¾
Savannah, Florida & Western—	
Waycross & Florida (5 ft.), Waycross, s. e.....	23
Walton (5 ft.), Social Circle n. to Monroe.....	10
Western & Atlantic (5 ft.)—	
Branch fr. near Cartersville to iron mines.....	4
.....	45
FLORIDA.	
St. John's & Lake Eustis (3 ft.) ex. to Fort Mason.....	14
Savannah, Florida & Western—	
East Florida, Jacksonville (5 ft.) n.....	1½
South Florida (3 ft.), Sanford s. by w. to Orlando.....	22
.....	37½
ALABAMA.	
Louisville & Nashville (5 ft.)—	
Pensacola & Selma, ex. n. to Western R. R.....	6
Pensacola R. R., ex. Pensacola Junction n.....	16
.....	22
LOUISIANA.	
Louisiana Western, Vermillionville w.....	56
Sabine River e.....	22
Morgan's Louisiana & Texas—	
Extension New Iberia n. w. and n. to Washington.....	46
.....	124
TEXAS.	
Corpus Christi, San Diego & Rio Grande (3 ft.)—	
Ex. San Diego s. w.....	5
Dallas & Wichita, ex. Lewisville n. w. to Denton.....	17
East Line & Red River (3 ft.), ex. Sulphur Springs w. to Greenville.....	30
East Texas, Beaumont n. to Pine Island Bayou.....	6
Galveston, Harrisburg & San Antonio—	
La Grange Branch, Smith's Junction w. by n. to Ellinger.....	16
Gulf, Colorado & Santa Fe, Sealy n. by w. to Rogers.....	110
Houston & Texas Central—	
Texas Central, Whitney w. to Mt. Airy.....	67
Houston, East & West Texas (3 ft.)—	
Ex. Trinity River n. e. to Livingston.....	12
International & Great Northern, Austin s. e. to Davenport.....	62
Missouri, Kansas & Texas—	
Denison Div., ex. Whiteright s. s. to Greenfield.....	32
Texas & Pacific, ex. Fort Worth w.....	151
Transcontinental Div., ex. Sherman west to Whitesboro.....	17
Texas & St. Louis (3 ft.), ex. Sulphur Springs s. w. to Big Sandy.....	76
Ex. Tyler s. w. to Trinity River.....	52
.....	653
ARKANSAS.	
Iron Mountain & Helena (3½ ft.), ex. n. w. to Marianna.....	6
Little Rock, Mississippi River & Texas—	
Main Line, ex. Pine Bluff n. w. towards Little Rock.....	25
Rob Roy Branch, near Pine Bluff n. to Micawber.....	3¼
Ouachita Division, Collins w. to Monticello.....	10
Washington & Hope, Hope n. w. to Washington.....	10
.....	60¾
TENNESSEE.	
Nashville & Florence, Columbia w. by s. to Mt. Pleasant.....	11
Nashville, Chattanooga & St. Louis—	
McMinnville & Manchester, ex. McMinnville n. e. to Caney Fork.....	13
Oakdale & Cumberland Mountain (3 ft.), Oakdale Junction e. to Oakdale Iron Works.....	8
.....	32
KENTUCKY.	
Chatteroi, Catlettsburg s. to Louisville.....	25
Elizabethtown, Lexington & Big Sandy—	
Big Sandy River n. w. to Ashland.....	6
Louisville & Nashville (5 ft.)—	
Cumberland & Ohio Branch ex. to Greensburg.....	1½
Louisville, Cincinnati & Lexington—	
Shelbyville Branch, ex. Shelbyville s. to Taylorsville.....	15
.....	47½
WEST VIRGINIA.	
Elizabethtown, Lexington & Big Sandy, Huntington w. to Big Sandy.....	10
OHIO.	
Cincinnati Northern (3 ft.), Norwood n. e. to Lebanon.....	24½
Cleveland, Tuscarawas Valley & Wheeling—	
Ex. Uhrichsville s. e. to Bridgeport.....	57
Columbus & Hocking Valley—	
Monday Creek Branch, ex. Carbon Hill to Oresville.....	6
Connoton Northern (3 ft.), Canton n. to Mogadore.....	20
Connoton Valley (3 ft.), ex. Oneida n. w. to Canton.....	22
Dayton & Southeastern (3 ft.) ex. s. e. to Wellston.....	15½
Detroit, Butler & St. Louis Ind. line n. e.....	22
Lake Erie & Western, Fremont e. by n. to Sandusky.....	24
McComb, Deshler & Toledo, Deshler s. e. to McComb.....	9
Mt. Glenad, Gilead station e. to Mt. Glenad.....	4
Ohio & West Virginia, Logan s. by e. to Gallipolis and n. e. to Pomeroy.....	84
Ohio Central, Main Line, Toledo s. e. to Bush's.....	147
Branch, Corning to Shawnee.....	20
Toledo, Delphos & Burlington (3 ft.), ex. Holgate n. to Waterville.....	27½
Southern Division, Mercer s. to Celina.....	27½
Dayton, Covington & Toleo, Covington n. to Versailles.....	10½
.....	500
MICHIGAN.	
Chicago & Northwestern—	
Menominee River, Quinnesec n. w. to Wis. line.....	7½
Chicago & West Michigan—	
Hart Branch, Mear's n. e. to Hart.....	3¼
Detroit, Butler & St. Louis, Detroit s. w. to Adrian.....	37
Detroit, Lansing & Northern—	
Stanton Branch, ex. Mecosta n. w. to Big Rapids.....	15
Detroit, Mackinac & Marquette—	
Point St. Ignace n. w.....	35
Marquette e.....	25
Flint & Pere Marquette—	
Clare County Branch, ex. n. to Harrison.....	6
Round Lake Branch, Butler Junction n. to Webber.....	4

Michigan Air Line, ex. Rochester w. by s. to Pontiac.....	10
Port Huron & Northwestern (3 ft.), ex. Crosswell n. to Sand Beach.....	44¼
Extension in Port Huron.....	4¾
Marlette Branch, Balmer's n. w. to Marlette.....	33¼
St. Joseph Valley, Buchanan n. w.....	2
Tawas & Bay County, ex. Camp Watson s. w.....	11
.....	255
INDIANA.	
Chicago & Grand Trunk, Valparaiso, n. w.....	15¼
Detroit, Butler & St. Louis, Butler n. e. to Ohio line.....	6
Indianapolis, Decatur & Springfield (completed).....	11
Indianapolis, Delphi & Chicago, Rensselaer n. w.....	7
Lake Erie, Evansville & Southwestern—	
Ex. Booneville e. by n. to Grigsby.....	16
Peoria, Decatur & Evansville, Evansville n. w. to Poseyville.....	18
Springfield, Effingham & Southeastern (3 ft.), Ill. line e. to Swift City.....	31
Toledo, Delphos & Burlington (3 ft.), Warren s. w. to Kokomo.....	44
Vernon, Greensburg & Rushville, Greensburg s. to Brewersville.....	20
.....	185¼
ILLINOIS.	
Chicago & Eastern Illinois—	
Grape Creek Branch, Danville June. s. w. to Grape Cr.....	6¾
Chicago & Western Indiana—	
Extension n. in Chicago.....	1
South Chicago Branch, South Chicago June. e. to Irondale.....	6
Chicago, Milwaukee & St. Paul—	
Libertyville Branch, Libertyville June. w. to Libertyville.....	3
Chicago & Pacific, ex. Byron w. to LaMar.....	27¼
Danville & Southwestern, ex. Lawrenceville s. to St. Francisville.....	10
Danville, Olney & Ohio River (3 ft.), ex. Westfield s.....	41½
Fulton County (3 ft.), Fairview s. e. to Havana.....	29
Illinois Central—	
Kankakee & Southwestern, ex. w. to Kankakee June.....	29¾
do. ex. Anchor s. w. to Cofax.....	4½
Jacksonville & Southeastern, ex. Virden s. by e. to Litchfield.....	23¼
Peoria, Decatur & Evansville, ex. Parkersburg s. toward Wabash River.....	24
St. Louis Coal R. R., ex. Carbondale w. to Harrison.....	9¼
Springfield, Effingham & Southeastern (3 ft.), Effingham e.....	60
Tuscola, Charleston & Vincennes (3 ft.), Charleston n. e.....	1
Wabash, St. Louis & Pacific—	
Chicago & St. Paul, completed between Auburn June. and Strawn.....	45
.....	321¾
WISCONSIN.	
Chicago & Northwestern—	
Chicago & Tomah (3 ft.), n. ½ mile s. of Rewy, n.....	8¼
Menominee River, Mich. line n. w. to Florence.....	9¼
Janesville s. to Afton.....	9¾
Madison & Milwaukee, Madison w. to Verona.....	9¾
Chicago, Milwaukee & St. Paul—	
Beloit Branch, Janesville s. to Beloit.....	14
Albany Branch, Brodhead n. w. to Albany.....	7½
Chicago, St. Paul, Minneapolis & Omaha—	
North Wisconsin, ex. n. e. to Cable.....	52½
Eau Claire Branch, Eau Claire to saw mills.....	2¼
Menominee Branch, Menominee to saw mills.....	3¼
Fond du Lac, Amboy & Peoria (3 ft.), ex. in Fond du Lac.....	1
Milwaukee, Lake Shore & Western, ex. Tigerton n. w. to Wausau.....	31½
Oskosh Branch, ex. to Oshkosh.....	10½
Aniwa Branch, Eland June. n. to Aniwa.....	11
Wisconsin Central—	
Wisconsin & Minnesota, Abbotsford w. to Chippewa Falls.....	54
Appleton Branch, Menasha June. to Appleton.....	2½
.....	226
MINNESOTA.	
Chicago, Milwaukee & St. Paul—	
Hastings & Dakota Div., branch Benton, n. e. to Minneapolis.....	29
Chicago, St. Paul, Minneapolis & Omaha—	
Blue Earth City Div., ex. Blue Earth City s. to Iota, line.....	10
South Stillwater Branch, Hudson Bridge, n. to S. Stillwater.....	2¼
St. Paul & Duluth—	
Knife Falls Branch, extended.....	1
Taylor's Falls & Lake Superior, Wyoming n. e. to Taylor's Falls.....	21
St. Paul, Minneapolis & Manitoba—	
Grand Forks, Moorhead & Barnesville, Barnesville n. w. to Moorhead.....	23¼
Morris & Brown's Valley, w. to Brown's Valley.....	47¾
.....	133¼
DAKOTA.	
Chicago & Northwestern—	
Dakota Central, ex. Volga w. to Mo. River.....	184¼
Chicago, Milwaukee & St. Paul—	
Hastings & Dakota Div., ex. Ortonville w.....	78
do., branch Milbank Junction n. w.....	22
Southern Minn. Div., ex. Flanagan w. to Madison.....	28¼
Iowa & Dak. Div., ex. Bridgewater w.....	81¾
Sioux City & Dak. Division—	
Sioux Falls line ex. Sioux Falls to Dell Rapids.....	13½
Elk Point Cut-off, Elk Point n. e. to Westport.....	49½
Chicago, St. Paul, Minneapolis & Omaha—	
Worthington & Sioux Falls Div., ex. Sioux Falls w.....	37
Northern Pacific, ex. w. to Montana line.....	124
Cassellton Branch, Cassellton n. to Blanchard.....	31
St. Paul, Minneapolis & Manitoba—	
Grand Forks, Moorhead & Barnesville, Fargo n.....	36
do. "Grand Forks June. s.....	24
Red River & Northern, Breckenridge n. w. to Durbin.....	48
Red River Valley Branch, Grand Forks w. to Ojata.....	12
.....	724
IOWA.	
Burlington & Northwestern (3 ft.), ex. Crawfordville n. w. to Washington.....	10
Burlington, Cedar Rapids & Northern—	
Pacific Division, Holland n. w. to Clarion.....	55
Muscatine Div., Thornburg n. w. to Montezuma.....	16
Chicago & Northwestern—	
Toledo Branch, Garwin w. to Jewell Junction.....	57½
do. Jewell Junction northwest.....	26½
Chicago, Burlington & Quincy—	
Red Oak & Atlantic, ex. north to Griswold.....	2¼
Bethany Branch, Davis City s. to Mo. line.....	3
Mt. Airy Branch, ex. Mt. Airy s. w. to Mo. line.....	14
Hastings Branch, Hastings n. to Carson City.....	15¾
Chicago, Milwaukee & St. Paul—	
Davenport Line, ex. Fayette n. w. to Jackson June.....	25
Rock Valley Branch, Rock Valley s. w. to Eden.....	9¼
Dubuque Div., ex. Midland June. s. to Clinton.....	8
Chicago, Rock Island & Pacific—	
Guthrie Branch, Guthrie n. by w. to Guthrie Centre.....	13¾
Keosauqua Branch, Mt. Zion s. w. to Keosauqua.....	4½
Griswold Branch, Atlantic s. by w. to Griswold.....	14
Carson Branch, Arcoa s. to Carson.....	13¾
Dubuque & Dakota, ex. Waverly e. to Sumner.....	23
Keokuk & Northwestern, Keokuk n. w. to Salem.....	37
Minneapolis & St. Louis, Forest City s. w. to Livermore.....	40
Coal Branch, near Fort Dodge s. to mines.....	8
Wabash, St. Louis & Pacific—	
Mo., Iowa & Neb., ex. Corydon w. to Van Wert.....	30
do., Albia Branch, Centreville n. to Albia.....	26
.....	456¼
NEBRASKA.	
Burlington & Missouri River—	
Republican Valley, ex. Bloomington w. to Indianola.....	78.6
do., "Amboy east (except 10 m. in Kansas).....	65.0



## LOCOMOTIVE RETURNS, AUGUST, 1880.

Master Mechanics of all American railroads are invited to send us their monthly returns for this table.

NAME OF ROAD.	MILEAGE.	MILES RUN TO	AVERAGE NO. OF LOADED FREIGHT CARS Hauled.	COST PER FREIGHT CAR PER MILE, CENT.	COST PER MILE IN CENTS FOR					AVERAGE COST OF	
					Repairs.	Fuel.	Shops.	Miscellaneous.	Total.	Coal, per ton.	Wood, per cord.
Republican Valley, Beatrice south and west.....	15.0										
Lincoln & Northwestern, ex. n. w. to Columbus.....	24.0										
Nebraska Railway, ex. Aurora n. to Central City.....	19.0										
Chicago, St. Paul, Minneapolis & Omaha—											
Omaha Division, Coburn Junc. s. to Oakland.....	53.0										
Sioux City & Pacific—											
Fremont, Elkhorn & Missouri Valley ex. Oakdale n. w. to Clearwater.....	14.2										
North Branch, Norfolk Junc. n. w. to Plainview.....	31.7										
Union Pacific—											
Omaha & Republican Valley, Grand Island n. by w. to St. Paul.....	21.9										
Omaha & Republican Valley, branch Valparaiso s. to Lincoln.....	20.3										
Omaha, Niobrara & Black Hills, branch Lost Creek w. by n. to Albion.....	34.4										
	377.1										
MISSOURI.											
Chicago, Burlington & Quincy—											
Bethany Branch, Iowa line s. to Bethany.....	25.4										
Mt. Air Branch, Iowa line s. to Grant City.....	8.4										
Missouri Pacific—											
Lexington & Southern Division, Pleasant Hill s. to Nevada.....	68										
Osage Valley & Southern Kansas, Tipton s. to Versailles.....	18										
Wabash, St. Louis & Pacific—											
Quincy, St. Louis & Pacific, ex. Novinger w. to Milan.....	27										
St. Louis & San Francisco—											
Arkansas Div., Plymouth s. to Seligman.....	32										
St. Louis, Salem & Little Rock—											
Branch, Salem s. e. to Riverside mines.....	7										
Branch to Stinson ore bank.....	4										
Branch, Sligo to Sligo Furnace.....	4										
Sedalia, Warsaw & Southern (3 ft.), Sedalia s. to Warsaw.....	42										
Springfield & Western Missouri, ex. in Springfield.....	19										
Extension Ash Grove w. by n. to Greenfield.....	19										
Kansas City, Fort Scott & Gulf—											
Rich Hill R. R., Kansas Line e.....	15.4										
Branch s. to Carbon Centre.....	4										
Branch n. to Spencer's Coal Banks.....	3										
Ft. Scott & Southeastern, Mo. line to Golden City.....	34										
	312.4										
KANSAS.											
Atchison, Topeka & Santa Fe—											
Manhattan, Alma & Burlingame, Burlingame n. w. to Manhattan.....	56.4										
Marion & McPherson Br., McPherson w. to Lyons.....	30										
Caldwell Br., Wellington s. to Caldwell.....	21										
Wellington & Western, junction w. to Chickasaw River.....	14										
Burlington & Missouri River—											
Republican Valley (in Neb.) Div., two sections of the Eastern Extension.....	10										
Kansas Central (3 ft.), ex. w. to Garrison.....	18										
Kansas City, Ft. Scott & Gulf—											
Ft. Scott, Southeastern & Memphis, ex. Arcadia to Mo. Line.....	2										
Memphis, Kansas & Colorado (3 ft.) Parsons s. w. to Cherryvale.....	10										
Rich Hill, main line e. to Mo. line.....	4.4										
Kansas City, Lawrence & Southern—											
Southern Kansas, ex. w. to Harper.....	82										
Sumner Co. Branch, Wellington s. to Hunnewell.....	18										
Missouri Pacific—											
Kansas & Arizona Div., branch Osawatomie n. w. to Ottawa.....	21										
St. Louis & San Francisco, ex. w. to Wichita.....	67.4										
	363.4										
COLORADO.											
Atchison, Topeka & Santa Fe—											
Pueblo & Arkansas Valley, Pueblo w. by n. to Coal Banks.....	37										
Denver & Rio Grande (3 ft.)—											
Leadville Division, ex. n. w. to Leadville.....	104.4										
New Mexico Division, ex. Alamosa s. w. to Alta.....	71										
New Mexico Division, Antonito s. to N. M. line.....	7										
Alpine Branch, 2 m. from Nathrop s. w. to Alpine.....	11.4										
Manitou Branch, Colorado Springs n. w. to Manitou.....	5.4										
Gunnison Division, South Arkansas s. w. to Poncho Springs.....	5.4										
Silver Cliff Branch, near Cañon City s.....	5										
Eagle River Extension, Leadville n. w.....	10										
Leadville, Ten Mile & Breckenridge, Leadville n. by e. to Kokomo.....	19										
* Less 10 miles (in two different places), which are in New Mexico.....											
Denver, South Park & Pacific (3 ft.)—											
Extension s. w. to Buena Vista.....	19										
Gunnison Extension, Nathrop w. to Heywood Springs.....	5										
Union Pacific—											
Julesburg Branch, Denver Junc. s. w. to Riverside.....	50.4										
	348.4										
NEW MEXICO.											
Atchison, Topeka & Santa Fe, main line ex.....	251.4										
Santa Fe Branch, Galisteo n. to Santa Fe.....	18.4										
Atlantic & Pacific, Isleta w. to Santa Fe.....	78										
Denver & Rio Grande—New Mexico Div., Colorado line s. to Espanola.....	86										
San Juan Division, (bends into N. M. in two places).....	10										
Southern Pacific, Arizona line eastward to Deming.....	97										
	540.4										
ARIZONA.											
Southern Pacific, Casa Grande e. to N. M. line.....	198										
UTAH.											
Union Pacific—											
Summit County, Echo south to Park City.....	27.4										
Grass Lake Branch of same, Watson's n. e. to mines.....	4										
Utah Eastern (3 ft.), Coalville s. by w. to Kimball.....	16										
Utah Southern Extension, ex. s. to Frisco.....	69										
	116.4										
MONTANA.											
Northern Pacific, Dakota line w. to Beaver Creek.....	8										
Union Pacific—											
Utah & Northern (3 ft.), Idaho line n. to Dillon.....	63.4										
	73.4										
NEVADA.											
Carson & Colorado, Mound House e.....	21										
Nevada Central (3 ft.), ex. s. to Austin.....	50										
	71										
CALIFORNIA.											
South Pacific Coast (3 ft.), gap filled.....	2										
OREGON.											
Oregon & California—											
Lebanon Branch, Albany s. e. to Lebanon.....	11.4										
Oregonian (3 ft.), ex. Dallas to Smithfield.....	9										
Ray's Ferry s. to Brownsville.....	72										
Oregon Railway & Navigation—											
Celilo e. and Wash. line w.....	73										
	165.4										
WASHINGTON.											
Northern Pacific, Pend d'Oreille Div. Atsworth n.....	45										
Columbia River Div., Atsworth s. to Wallula.....	12										
Oregon R. R. & Navigation Co., Wallula s. w. to Or. line.....	5										
	62										

## THE SCRAP HEAP.

## The New Lowell Depot.

The Boston & Lowell Company has just completed a building in Lowell, Mass., which presents the somewhat unusual combination of a passenger station and an opera-house. It

\* Five empty cars rated as three loaded ones.  
 + Switching engines allowed 6 miles per hour; helping engines, actual distance run.  
 † Switching engines allowed 6 miles per hour.  
 ‡ Fuel not estimated.  
 § Two empty cars rated as one loaded one.  
 ¶ Switching and train engines allowed 6 miles per hour.

\*\* Three empty cars rated as two loaded ones.  
 †† Switching engines allowed 6 miles per hour; five empty cars rated as three loaded ones.  
 ‡‡ Switching engines allowed 6 work-train 5 miles per hour.  
 §§ Engineers, firemen's and wipers' wages not included in cost.  
 ¶¶ The ton of coal is 2,000 lbs., unless otherwise noted; 25 bushels counted to the ton.

is thus described by the Lowell correspondent of the Boston Journal:

"In the latter part of October, 1879, work was commenced on the new Boston & Lowell Railroad station in this city, and it was ready for occupancy about two months ago. This depot is elegant and spacious, surpassing any building of the kind in New England outside of Boston. It is 146 ft. deep, having a frontage of 118 ft. on Essex street, the principal thoroughfare of the city. On the east side of the main entrance are two large waiting rooms 26 by 31, with ticket-office and toilet rooms between. All the rooms are handsomely and conveniently fitted up with everything necessary for the ease and comfort of the traveling public. Further back are the conductors' and station agents' rooms, which are large, airy and handsomely furnished. On the west side is the dining saloon, 23 x 50, and the dining room, 28 x 31. There is also a large and elegant store on this side fronting on Essex street. But what especially delights the hearts of the people of our city is the new Opera-House, which occupies the second story of the large edifice and all the space above it. Through the courtesy of Mr. Clark R. Caswell, the Lawrence agent of the road, we yesterday visited this beautiful theatre, which is rapidly approaching completion, and which, we understand, will be thrown open to the public in about two weeks. The entrance is on Essex street. From the lower hall a staircase, 10 ft. wide, leads to the ticket office, whence two broad stairways conduct one to the lobbies above. The long lobby is 118 ft. long and 24 ft. wide, the side lobbies are of the same width and 24 ft. in length, exclusive of stairways. Here we enter the auditorium of the theatre, which is 100 ft. long, 85 ft. wide and 60 ft. high, and contains 882 chairs. The balcony has 618 chairs, making the seating capacity of the house 1,500. The stage, including dressing rooms, is 92 ft. long and 52 ft. deep, with 11 dressing rooms, 5 above and 6 below, and there is a large elevator for transporting baggage from the depot beneath. On each side of the stage are two proscenium boxes, tastefully and handsomely fitted up. The balcony railings and those back of the orchestra are upholstered in maroon plush. This part of the work is done by the railroad, the cloth curtain of Terry in front of the stage being of the same rich color. The chairs, which are from the manufactory of Baker, Pratt & Co., New York, are of iron and birch, with perforated backs and seats, with hat rests beneath in the form of a spring, and convenient foot rests in front. The numbers are painted on wood both front and back and set in an open place in the back of the chair. In the dome is a handsome chandelier, or chandelier and reflector combined, having 100 burners. There are 450 burners in all, including the stage, where 80 footlights with Argand burners are set. All this apparatus, which is chaste and unique in design and of highly polished brass, is from the establishment of Stillman & Nicoll, Washington street, Boston.

"The drop curtain is a very pretty thing, representing a

scene on St. John's River, Florida. On the left is a grove of palmetto trees, and on the right a lighthouse. In the centre is the shore, with the sun just rising and touching the sands with a golden hue. This is painted by Story, of Boston, and is considered one of his best efforts. The frescoing of the whole building is beautiful and chaste, and the colors pleasing and harmonious. This is the work of W. S. Braser of Boston. The walls are of a rich creamy tint, the ceiling all blue, the panels red. Four of the large panels in the dome have figures of Melpomene, Thalia, Euterpe and Terpsichore. There 12 panels in the dome, which can be removed and glass substituted when light is needed for day entertainments or rehearsals. The panels on either side the stage are also decorated with graceful mythological figures. The proscenium arch is gracefully ornamented with brilliant colors, which adds greatly to the effect of the whole. The whole building is finished in Western ash, and is to be lighted with electricity. There are two ways of exit, and even a large audience would find it easy to reach the street in a very short time. In fact, the entire edifice is a model of comfort, elegance and convenience, and is larger than any theatre in New England except the Globe and Boston Theatres. It supplies a want long felt in this city, that of a commodious place for first-class concerts and dramatic entertainments. Mr. Charles T. Emerson, of Lawrence, is the architect, and he has reason to congratulate himself on so complete a success as the new Opera-House. The Boston & Lowell road has been most liberal and generous in fitting up this elegant theatre, and has spared no pains to make it an ornament to our city. It is not yet definitely known whether Manager Hosford contemplates any formal ceremonies for the opening night, but in all probability the first evening will be given to the railroad and its friends and with some suitable entertainment."

## A Phantom Train.

We learn that a mysterious apparition was seen one night recently, which was nothing more nor less than a phantom locomotive. The narrator, whose name we withhold, was walking the track of the Western & Atlantic Railroad, about two miles from town one night last week, when he discovered the headlight of an engine approaching around a curve. Strange to say, he heard no noise as the train came on, and presently he stepped from the track and waited for it to pass. He was still puzzled why no noise attended the engine's approach, and as it came opposite he noticed that the whole machinery had a ghostly, phantom-like appearance. At the throttle stood a pale, wild-eyed engineer, while a spectre-like fireman was pulling the bell rope, but no sound came from the bell. All this he observed as the train rushed past him like a shadow. He swore that the object he saw was a phantom train, of which there are several mentioned in railroad lore.—*Dallas (Ga.) Citizen.*

Is the Citizen prepared to say how much peach and honey the witness of this strange occurrence had on board?





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CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

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## EDITORIAL ANNOUNCEMENTS.

**Passes.**—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

**Addresses.**—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

## RAILROAD CONSTRUCTION IN 1880.

We publish this week our annual record of new railroad construction in the United States during the year 1880—perhaps the most remarkable of the nine that we have compiled, though the extent of the new road is not quite so great as that constructed in the year 1872. The latter year, however, was the culmination of a period of great activity and enterprise, while 1880 is only the second in which (in this direction) there has been any considerable recovery from the inactivity of the "hard times." But in 1879 we constructed 80 per cent. more road than in 1878, and in 1880 we have constructed 56 per cent. more than in 1879, 145 per cent. more than in 1878, and considerably more than in the three years ending with 1877.

The number of miles completed in each of the last nine years has been:

Year.	Miles.	Year.	Miles.
1872	7,340	1877	2,315
1873	3,883	1878	2,916
1874	2,025	1879	4,570
1875	1,561	1880	7,150
1876	2,450		

We have corrected our figures from year to year from all available sources, and know that the above figures are very nearly correct for new road on which track was laid during the year. This includes every year a considerable mileage not open for traffic. Absolute accuracy is unattainable, as may be judged from the fact that we sometimes get two very different statements of the road constructed in the year from different officers of the same company. We, however, watch the construction carefully throughout the year, seek explanations of discrepancies, and believe that we eliminate most of these errors, even, within a year or two of the construction. The labor required this year has been truly enormous, and we believe the record to be exceptionally complete and accurate, though doubtless we shall have some correc-

tions to make. We will thank any reader to call our attention to any errors he may discover.

If we distribute the new mileage on the two sides of the Mississippi, we have:

	East of Miss.	P. c.	West of Miss.	P. c.	Total.
1872	4,353	59.3	2,987	40.7	7,340
1873	1,527	39.3	2,356	60.7	3,883
1874	1,487	73.5	538	26.5	2,025
1875	949	60.8	612	39.2	1,561
1876	1,156	47.0	1,304	53.0	2,460
1877	1,114	48.4	1,187	51.6	2,301
1878	1,178	40.4	1,738	59.6	2,916
1879	1,285	28.1	3,285	71.9	4,570
1880	1,452	20.4	5,698	79.6	7,150

Thus the increase in new construction has been almost entirely west of the Mississippi. There was only 15 per cent. more road built east of the Mississippi in 1880 than in 1879, while seventy-one per cent. more was built west of it. In 1872 and earlier the chief construction was in the states west of the Mississippi and north of the Ohio, which were then much in the condition that Minnesota, Iowa, Nebraska and Kansas have been since—with a large and growing population, but not sufficiently provided with railroads. By 1872 these states were pretty well provided with railroads, and during the prolonged business depression following 1873 very little road was built anywhere to develop new country, but what was constructed was largely to accommodate a traffic already developed and waiting for it, and so naturally was pretty well scattered over the well-peopled states. But when confidence returned so that capitalists were willing to make investments dependent upon the future growth of the country for their profit, naturally they turned to that part of the country which had most room to grow, but had begun to be developed, chiefly west of the Mississippi.

The following table shows the mileage completed in each of the states which either in 1879 or 1880 built more than 300 miles:

	1880.	1879.		1880.	1879.
Dakota	724	241	Kansas	304	556
Texas	653	156	Colorado	248	101
New Mexico	540	167	Illinois	322	925
Ohio	500	209	Missouri	312	213
Iowa	457	500	Minnesota	134	451
Nebraska	377	285			

Of these only Ohio and Illinois are east of the Mississippi. Ohio, though very full of roads, a large proportion of which do not pay well, has built many miles of railroad even in many of the dull years—more since 1871 than any other state east of the Mississippi except Illinois and New York, and more since 1872 (which except in the last two years have been dull years for railroad building) than any other state east of that river except Pennsylvania. Both Ohio and Pennsylvania have built their new roads, since 1872, chiefly to supply local traffic, and the growing coal-mining and iron-manufacturing interests of Ohio have caused the construction of numerous railroads there of late years. Since 1872, when the previous railroad-building era culminated, only Texas, Iowa and Kansas have built more railroad than Ohio, as will appear from the following table, which shows the number of miles of railroad completed in each state that has built more than a thousand miles in the eight years from 1873 to 1880 inclusive:

	1880.	1879.		1880.	1879.
Texas	2,042	1,107	California	1,093	1,077
Iowa	1,769	1,093	Illinois	1,077	1,009
Kansas	1,556	1,077	Colorado	1,065	1,037
Ohio	1,308	1,009	Dakota	1,037	1,012
Minnesota	1,214	1,065	New York	1,012	
Missouri	1,191	1,037	Wisconsin		
Pennsylvania	1,123	1,012	Indiana		

Texas has such an enormous area—including probably three times as much productive land as any other state—that the amount of construction there is not comparatively as great as in some of the other states. Six of the states in this list can properly be called new—Texas, Kansas, Minnesota, California, Colorado and Dakota—and two or three of the others have still a good deal of unoccupied land; but, as we have said, it has only been during the past two years that there has been much effort to build railroads to serve a new country, and the figures for the last year show that this has now been begun with great vigor.

However, it is a mistake to suppose, as many do, that the revival of railroad construction has affected the far West only. Our tables of mileage constructed in each state and section shows that while there was an increase of 56 per cent. from 1879 to 1880 in the aggregate amount constructed in the United States, there was an increase of more than 100 per cent. in New England and in the Middle States, and of 170 per cent. in the South Atlantic States, more than 100 per cent. in the old and steady group of states formed by Ohio, Michigan and Indiana, and only 18 per cent. in the eight states of the upper Mississippi valley which we have called "Northwestern," which include Dakota, Nebraska and Kansas on the west; less than 100 per cent. in the territory west of the division which we have called the "Far West Interior," and nearly 200 per cent. in the Pacific states. Further, the increase in the "Northwestern" states is by no means

general. Minnesota constructed more than three times as much in 1879 as in 1880, Kansas one-half more, Iowa one-tenth more, and the amount constructed in Minnesota was positively small—the smallest for four years. But, except in Illinois, where the new railroad was largely built to form parts of through lines, and will be supported chiefly by diverting traffic from roads previously existing, the new road in the Northwest has been chiefly built in new country, or to serve districts hitherto insufficiently accommodated. This is true in a state as far east as Wisconsin even, which has not a very large railroad system; and nearly everywhere west of the Mississippi except, perhaps, in Eastern Iowa. The Dakota lines have all been built in advance of traffic, but they are by no means crowded, or will not be when the country is fairly occupied.

To what extent the activity in railroad construction has moved westward may perhaps be seen better by the following statement of the number of miles constructed each year in the first tier of states west of the Mississippi (including Minnesota, Iowa, Missouri, Arkansas and Louisiana) and in the second tier (including Dakota, Nebraska, Kansas, Indian Territory and Texas).

Year.	First tier.	Second tier.	Year.	First tier.	Second tier.
1872	1,242	1,400	1877	400	344
1873	625	543	1878	804	424
1874	133	136	1879	1,250	1,233
1875	150	57	1880	1,088	2,118
1876	280	416			

Thus until last year the amount of construction was not very greatly different in the two tiers—less than 400 miles when greatest—but in 1880 nearly twice as much was built in the western tier, and then, too, was by far the largest amount of construction there has ever been in the third tier, including Montana, Colorado and New Mexico—not less than 940 miles.

All this with regard to the field where railroad construction has been most active deserves study, because it indicates where new supplies of traffic are coming from. Unless egregious mistakes have been made by those who have built these railroads, there is to be directly a great development of Dakota, Texas and the states between, and of Colorado and New Mexico. Within a single year the country has taken a long stride westward, and the extensions of the Northern Pacific, the Atlantic & Pacific, the Texas & Pacific, the Denver & Rio Grande, and of several roads in Texas, show that still further progress in that direction is expected. There is doubtless a great field left, but it is quite possible to push this work too fast; for, however, inviting the country, it will not all of it be occupied at once, and while, if but a thousand miles of railroad in new country should be built in a year, the movement of population, concentrated on this thousand miles, might support it from the first, it is different if two or three thousand miles are built. A thousand miles of railroad, it should be remembered, has land enough for 200,000 160-acre farms within 25 miles of it.

As for several years previously, the construction of 1880 was chiefly by old companies, which were already operating railroads, and have much to lose by the construction of unprofitable lines; and, on the whole, the new roads seem to be wisely placed with reference to securing traffic, and to have been undertaken with a view to making profits from the operation, not the construction, of them. Not until near the close of the year did it become easy to raise money for schemes not undertaken by responsible corporations. There are now signs that capital can be had for asking, and if this proves to be true, we shall be sure to have a great number of contractors' railroads—railroads projected solely for the sake of the profit that may be made in constructing them, whose projectors will care little for and perhaps know nothing of their earning capacity. One would suppose that the experience of the years previous to 1873 would be sufficient to prevent the public from investing in such schemes; but most people have short memories, it seems.

Construction was much costlier in 1880 than in 1879, because of the much higher prices of rails and rolling stock; otherwise there was not much difference.

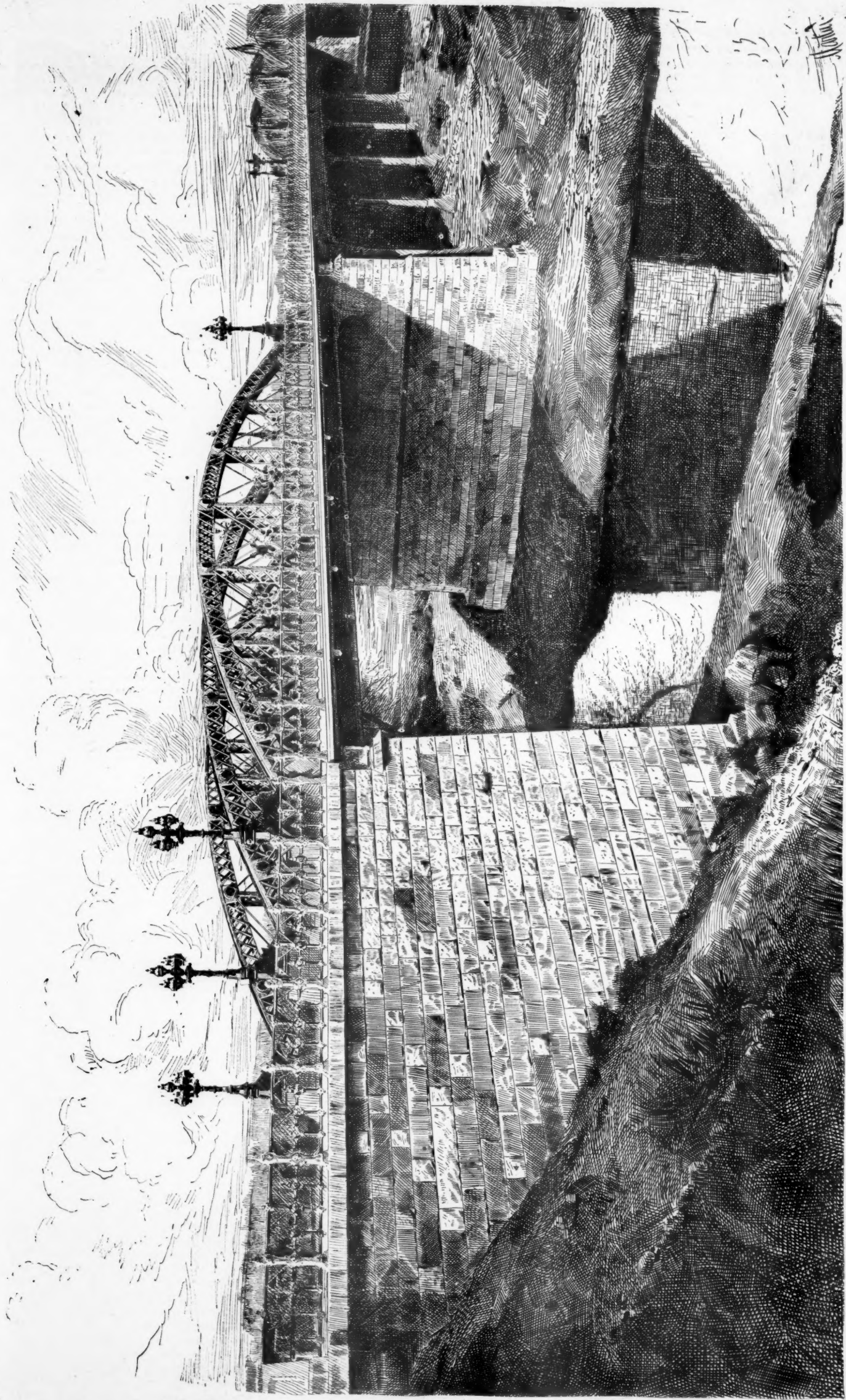
Among the more important lines—or at least the longer ones—constructed during the last year are the Atchison, Topeka & Santa Fe and the Southern Pacific, which have nearly met, and together will complete a new route across the continent; the extensions of the Northern Pacific and the Texas & Pacific; the beginning of the Atlantic & Pacific, which is to be a third line to California; the line of the Chicago & Northwestern to the Missouri River in Dakota, and the great system of lines built by the Denver & Rio Grande to some Colorado mining districts.

The 7,150 miles of road were in 246 different lines and built by or for 150 different companies. This gives an average of 47½ miles per company and 29½ miles per line. This is much more than in the years of light



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THE RAILROAD GAZETTE, JANUARY 28, 1881.

CALVERT STREET BRIDGE, BALTIMORE, MD.

*C. H. Latrobe, Engineer.*



## MILEAGE OF NEW RAILROAD CONSTRUCTED IN EACH STATE AND TERRITORY FOR NINE YEARS.

	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Alabama.....	134	2	18	0	0	11½	22	7	22
Alaska.....	0	0	0	0	0	0	0	0	0
Arizona.....	0	0	0	0	0	0	30	152	198
Arkansas.....	156	247½	18	38½	49	0	74	23	60½
California.....	105	85	140½	185	344½	235½	102½	12½	348½
Colorado.....	103	121	23	111½	154½	123½	204½	101	339½
Connecticut.....	25	29	0	21	7	0	0	0	724
Dakota.....	210	80½	0	0	0	0	24	240½	0
Delaware.....	20½	21½	19	5	0	0	6	0	0
Florida.....	10½	0	18	0	0	13	0	32	37½
Georgia.....	46	122	5	4	42	0	67	39½	45
Idaho.....	0	0	0	0	0	0	100	104½	321½
Illinois.....	68½	274½	231	200	58	55½	103	124½	185½
Indiana.....	142	0	208½	100½	72½	24	84	164½	0
Indian Territory.....	452	94	48	84½	96½	157½	232½	500	456½
Iowa.....	445	36	61	0	76	86½	183½	550½	363½
Kansas.....	143	65½	31½	0	138	28½	23½	67	47½
Kentucky.....	3	0	0	0	0	0	0	72	124
Louisiana.....	62½	0	37½	10	20	0	0	20½	0
Maine.....	191	34	12	17	15	0	8	21	40½
Maryland.....	37	117½	27½	36	5	17½	6	5	42½
Massachusetts.....	571	196	48	30	46	56	111½	72½	255
Michigan.....	307	48	36	0	34	264	338½	450½	133½
Minnesota.....	12	7	27	0	10	8	34½	12½	0
Mississippi.....	314	236½	31	27	139½	36	225½	213½	312½
Missouri.....	0	0	0	0	0	0	0	0	0
Montana.....	212	18	40	64	0	0	55	28½	71
Nebraska.....	13	0	45	15½	9½	18	35	9½	0
Nevada.....	103	40½	39	72½	84	81½	3	6	54½
New Hampshire.....	0	0	0	0	0	0	8½	167½	54½
New Jersey.....	435	242½	125½	206	69½	151½	129½	93½	47½
New Mexico.....	60	15	68	13	43	27	16	19	30½
New York.....	459½	172	172½	26	275	280	174½	204½	165½
North Carolina.....	82	0	0	0	0	0	35	64	153½
Ohio.....	231	203	14	0	9	9½	0	7½	0
Oregon.....	88	22	0	15	17	48½	16½	5	31
Rhode Island.....	15	114	0	0	7½	21½	10	165	32
South Carolina.....	391	385½	75	34½	387½	188½	162	156	653
Tennessee.....	57	85	59	27	6	20	14	133	116½
Texas.....	31	53	3	32	7	71	0	61	36
Utah.....	409	36	70½	0	10	16½	16½	339½	267
Vermont.....	40	50	0	0	0	52½	15	3	10
Virginia.....	76	36½	0	0	0	2½	22½	25	10
Washington Territory.....	459½	320½	162	23	123½	62	91½	94½	226
West Virginia.....	0	0	0	0	0	5	0	0	0
Wisconsin.....	0	0	0	0	0	0	0	0	0
Wyoming Territory.....	0	0	0	0	0	0	0	0	0
Total.....	7,340	3,883	2,025	1,561	2,450	2,315	2,916	4,570	7,150

## RECAPITULATION BY SECTIONS.

	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
New England (a).....	198	282	120	114	50	119	41	49	115
Middle States (b).....	1,010	541	387	437	259	352	344	145	302
South Atlantic States (c).....	244	261	144	32	114	92	116	117	314
Gulf States (d).....	500	304	138	24	398	213	218	280	837
South Interior (e).....	535	464	49	39	197	70	64	280	150
North Interior (f).....	1,210	452	400	166	393	349	370	446	940
Northwest (g).....	3,986	1,130	509	357	550	670	1,254	2,465	2,915
Far West Interior (h).....	180	224	122	202	154	162	357	78	1,348
Pacific States (i).....	317	135	147	180	345	288	152	80	229
Total.....	7,340	3,883	2,025	1,561	2,450	2,315	2,916	4,570	7,150

(a) New England includes Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut.  
 (b) The Middle States includes New York, New Jersey, Pennsylvania, Delaware, Maryland and the District of Columbia.  
 (c) The South Atlantic States include Virginia, North Carolina, South Carolina and Georgia.  
 (d) The Gulf States include Florida, Alabama, Mississippi, Louisiana and Texas.  
 (e) In the South Interior are included Indian Territory, Arkansas,

Tennessee, Kentucky and West Virginia.  
 (f) The North Interior includes Ohio, Michigan and Indiana.  
 (g) The Northwest includes Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska and Dakota.  
 (h) The Far West Interior covers the district between Texas and the Northwest and the Pacific States.  
 (i) The Pacific States are California, Oregon and Washington Territory.

construction. In 1878, when but 2,916 miles of road were built, there were 152 constructing companies, so that the average for each was then but 19½ miles.

Of the 7,150 miles of new road, 1,453 miles were of narrow-gauge (13½ miles 3½ ft. and the rest 3 ft. gauge). The miles of narrow-gauge road built each year and the percentage of the total that was narrow-gauge have been as follows for seven years:

Year.	Miles.	P. c. of totals.	Year.	Miles.	P. c. of totals.
1874.....	422	20.4	1878.....	990	33.9
1875.....	255	16.4	1879.....	895	19.6
1876.....	537	22.0	1880.....	1,453	20.3
1877.....	796	34.4			

During the year 79 miles of narrow-gauge road were changed to the standard and 30 miles abandoned, while 54 miles of standard were changed to 3 ft. The chief builder of narrow gauge road in 1880 was the Denver & Rio Grande, which completed 333 miles—more than was built by any other company of any gauge, by the way, except the Atchison, Topeka & Santa Fe (428 miles), and the Chicago, Milwaukee & St. Paul (351), the Chicago & Northwestern ranking fourth with 310 miles of new road.

By the last issue of Poor's Manual, the total length of railroad in the United States at the beginning of 1880 was 86,497 miles; adding the construction of 1880 we had 93,637 miles of railroad in the United States at the beginning of the current year. By the new census the population of the country on the 1st day of June was 50,152,000, which at the rate of increase of the last decade had become about 50,890,000 at the end of the year. The increase of population is at the rate (very nearly) of 2½ per cent. a year; the increase in the railroad mileage last year was 8¼ per cent. At the beginning of the year there were 573 people per mile of railroad; at its end, only 543. In Europe there are 3,333 people per mile of road; in Sweden, where the population per mile of road is least, 1,667. As we said recently, of course this rate of construction cannot be maintained for any great length of time. Kept up for ten years it would give us 205,000 miles of railroad at the end of 1890, for a population of 66,000,000, or a

mile of road to every 322 inhabitants. But the prospects now are for a great amount of construction in 1881.

Preparations have all been made for a great deal by responsible companies, who have, or will easily get, the necessary capital. The Northern Pacific, besides pushing its main line in Washington and Montana, will build several branches in Dakota; the Denver & Rio Grande will prosecute a number of lines in Colorado and New Mexico, and proposes building 500 miles or more within the year; the Texas & Pacific will probably be completed, and several other roads in Texas will be extended, probably considerable distances, toward the Rio Grande farther south; a long line will be begun in Louisiana, the Atlantic & Pacific will be extended toward the Pacific, many extensions of lines in Dakota will be made, and besides these there are numberless projects, which, if the capital can be obtained for them, will result in the building of a vast amount of road within the next two years. There is no doubt that too much road will be built. In the far West, where there is room enough but not yet people enough for the roads, the companies whose lines reach the border of the unoccupied field are forced forward faster than they desire to go, by the probability that if they do not build, a competitor on the right or left of their line will push forward and occupy the field in front of them.

The immediate effect of this great amount of construction is very favorable to the business of the country. There is a great demand for labor and materials; the iron works and nail mills are pressed to the utmost; the demand for rolling stock is so great that it is difficult to get orders filled without long waiting; and most other industries feel the effect of this great expenditure of capital in construction. A sudden decrease now in the annual mileage constructed from 7,000 to 3,000 or 4,000 miles, would doubtless bring ruin to many; but such a decrease is sure to come, though it may not be sudden, and there is not the slightest sign of its coming now. We shall probably build more railroad in 1881 than ever before.

## STANDARD TIME.

When intercourse between different regions and places was slow and infrequent, not much inconvenience resulted from counting time from different periods at each change of longitude. Then exact punctuality was not required. Railroads have, however, changed this condition of things, and their enormous traffic can now be conducted only by a strict observance of time. The need of a common standard to count from is therefore felt more and more each year as the railroad system is extended and grows more complicated.

In one of the railroad guides a list of eighty-seven places is given in the United States and Canada, in each of which the time differs from that at Washington and all the others, and it is said that "each one of the points named is the established standard for the running of trains upon one or more roads." It is not surprising then that the subject has attracted a great deal of attention, and that suggestions have been made, on different occasions, to establish a common standard for all railroads of the country. Quite recently a proposition has been made in Connecticut to fix a local standard for that state alone, and a bill has been drawn to be presented to the Legislature to compel the railroads there to conform to it. If the framers of that law had realized the confusion which must result to some of the railroads, which extend beyond the limits of Connecticut, if they were compelled to conform to a local standard, such as is proposed, they would hardly have attempted the adoption of a measure of this kind. At the western end of the state, the Connecticut roads must run by the time of New York, and at the eastern end by that of Boston, and in the middle probably by that of Hartford. Each of the roads adjusts itself to the difficulties as best it can, and any legislative interference would probably only increase the difficulty, unless it embraced the whole country, and applied to all the roads in it.

One of the principal obstacles in the way of the introduction of a standard for railroad time is the difficulty of distinguishing it, when written or spoken, from local time. Thus, if, for example, Washington time were the established standard, and it was said in New York or Chicago that a train left at 8:30, the question would often arise whether that meant local or standard Washington time. This ambiguity would exist everywhere, excepting on the meridian of Washington. Those who use railroad guides or time-tables much are also often perplexed to know whether 8:30 means 8:30 a. m. or p. m. In some railroad guides the night hours are printed in heavy or full-faced type to distinguish the night from the day trains. In some foreign railroad guides a heavy line is printed alongside the column which represents the time of night trains, so as to distinguish them from day trains. To meet this difficulty, and also to make it obvious always, in writing or in speech, whether local or standard time is meant, and whether a. m. or p. m., it was proposed by a correspondent in these columns as long ago as May 7, 1870, that the 24 hours of standard time should each be designated by a separate letter instead of a number. Although we have called attention to this suggestion a number of times in these pages during the past few years, we venture to do so again, as the subject of standard time seems now to have attracted attention anew. To carry out this suggestion, it was proposed to arrange letters on the face of ordinary clocks and watches, as indicated in the figure herewith. The hands could then be set to indicate either local or standard time, whichever would be most convenient for the owner of the time-piece to use. The hours of the first would then be designated by numbers as Roman numerals, as at present, whose standard time would be indicated by letters.

Quite curiously, commencing on the dial with A for midnight gives us exactly the right number of letters to bring M, which is always used to designate noon, to midday. It might be best though to omit either I or J, because the same written character is used for both of these, which would be certain to lead to error, especially in written train orders. Making A correspond with 1 o'clock, and omitting J, would again make M indicate noon.

By the arrangement of letters in the engraving herewith, 1:30 p. m. would be B. 30, 1:30 a. m. N. 30. Whether this was written or spoken, it will be seen it would, if this system was adopted, at once distinguish standard from local time and a. m. from p. m. It would thus avoid two sources of confusion. By the system proposed, the present methods would not be disturbed. All that would be needed would be new faces for our clocks and watches and then, as already stated, persons could set the hands to keep either local or standard time, as would suit their convenience.



best, or two sets of hands could be used, one to indicate local and the other standard time. Their form should of course differ materially, so that there would be no danger of confusing them. In order to make it quite obvious which indicated standard or railroad time, the hands for the latter might be made in the form of a semaphore arm. Of course the hands to indicate local and those for standard time would always occupy a fixed relation to each other in any given place. Thus, if Washington time was used in New York, the local minute hand would be 12 minutes ahead of the standard time, and the local hand  $\frac{1}{2}$  of an hour ahead. At Chicago the local minute hand would be 43 minutes behind the one which indicated standard time and the one hour hand  $\frac{1}{3}$  of an hour behind the other.

This system, it is believed, would overcome all the difficulties in the way of adopting a standard time, and would be much more definite and certain in every way than that at present in use.

The question then comes up, what standard should be adopted. Connecticut, it will be seen, wants one of its own, which would probably go by the name of the nutmeg standard. New York city, having the largest population and being the metropolis, might assume that fact as a reason why time elsewhere should be made to conform to hers. The national meridian now intersects Washington. St. Louis would have claims, because it is nearer to the geographical centre, and it would be hard to find any paramount reason why any one of these should be selected over all others. If the system proposed was employed, there is really no reason why any one place should be selected rather than another. In this as in some other cases it is not so important what is agreed upon as that some one thing be universally accepted. The paramount consideration, then, in selecting a standard, is to take that one in which the public generally are most likely to agree. Agreement is the end to be aimed at.

There are, though, some considerations which are world-wide in their influence, and which indicate that a standard of time might be adopted which would become universal in the whole civilized world. It has recently been reported that the Imperial Academy of Science at St. Petersburg has indorsed the suggestion made some time ago by Mr. Sanford Fleming, a Canadian engineer, for the establishment of a new prime meridian for the world 180 degrees from Greenwich, and the adoption of a standard time of reckoning. The British astronomers royal have given it, it is said, unfavorable opinions of the suggestion, "inclining to the Greenwich meridian as too firmly established by usage to be abandoned with propriety."

In discussing the subject the New York *Herald* very pertinently says:

"The 180th meridian cuts the Pacific Ocean into two nearly equally parts, but it passes through no island of any magnitude or widely known, and is far from any astronomical observatory or commercial centre. In fixing the zero point of longitude for the world, it is evidently of greatest moment that some point be taken which is most widely known, especially to navigators, who, more than any other class of men, refer to it. Every meridian has as much natural right to be the standard as any of its fellows. But the consideration just named is entitled to decisive weight, and has led to the general adoption of Greenwich, which most nearly fulfils the conditions required by those most engaged in measuring terrestrial distances on east and west lines."

"The objection to Greenwich as the international standard, if based on any ground, is based apparently on nothing more than silly national prejudice, which has operated, unfortunately, to prevent concert in settling a point of importance to geographical and cartographical science."

There is very little reason for selecting one meridian rather than another unless we take into account the location with reference to the facilities for establishing observatories, in which case the Greenwich meridian is much the best, and the 180th perhaps the worst. The main point to be considered is, which meridian can the world be induced to agree on with the least difficulty. Under that test Greenwich would unquestionably be selected. To take any other would throw our geographies and our navigators into confusion.

If then a new standard of railroad time is adopted, why not take that of the meridian of Greenwich? If that were done in this country, it would at once bring our whole system of time in agreement with that which is almost universally used in navigation over the whole civilized world. British railroads are now all run by Greenwich time. British ships and ours—the few we have—all sail by it, and if our railroads should conform to that standard, its use would be extended over 125 degrees of longitude in the northern hemisphere, and commerce might be trusted to extend it to the rest of the world.

The important thing though, is to adopt a common standard. If our national pride will not permit us to use the meridian of another country, let us select that of Washington. If we agreed upon that or any other,

it would afford great facilities for regulating our clocks and watches daily from the observations in the country, and then Yale could not clamor in Connecticut for New Haven time, while Cambridge was urging Boston as the only proper place for any well regulated railroad to get its time from. At present, Washington University in St. Louis regulates the time of that city, at the quality of which doubtless the University of Chicago sneers disapprovingly. Give us one standard, and it would cause all the observatories in the country to act in unison and reduce to order the present conflicting time-tables by which it sometimes happens that different trains must observe different times on the same track, and which, oftener still, perplex travelers who must in a measure be governed by them.

#### Growth and Traffic of Missouri River Towns.

The great amount of new railroad construction and the rapid growth of population west of the Missouri make it important to inquire where the traffic centres of that country will be. Nearly all its growth has been during the fifteen years since the war, and the changes have been so great and so rapid that it has not been easy to see where the traffic of this vast territory would concentrate. Business men and speculators in real estate give great attention to these matters, but they, and especially the latter, are so interested that their representations have to be taken with many grains of allowance; they exaggerate the advantages and the actual population of their own towns, and depreciate those of all others that may be competitors.

The census, however, gives us some trustworthy data by which we can trace the progress of these Missouri River towns for the last decade, within which the railroad systems which bring them traffic and largely determine the conditions of their existence have been chiefly created.

Below we give the population of the six leading towns on the Missouri River from Omaha to Kansas City, inclusive, a distance of 200 miles:

	1870.	Inc. or Dec.	P. c.
Omaha.....	30,518	16,083	52.8
Council Bluffs.....	18,059	10,920	60.5
St. Joseph.....	32,484	19,565	59.9
Atchison.....	15,106	7,054	46.7
Leavenworth.....	16,550	17,873	107.8
Kansas City.....	55,813	22,260	39.9
Total.....	168,530	102,835	60.9

Almost universally the rate of increase decreases as the population increases, and the doubling of the population of 5,000 in ten years is a very much commoner event than an increase of 50 per cent. in the population of 30,000 in the same time. Thus Chicago's percentages of increase in successive decades has been:

Decade.	Population.	P. c. of increase.
1840 to 1850.....	4,853 to 29,963	1,175.0
1850 to 1860.....	29,963 to 112,172	241.0
1860 to 1870.....	112,172 to 208,977	106.0
1870 to 1880.....	208,977 to 503,304	68.3

Chicago has had a more rapid growth than any other city, and especially since it has been a large city, and in the last decade its rate of growth, we see, has been greater than the average of the Missouri River towns—the amount of its growth in this decade, by the way, was greater than the total population of those six places. No other place of 100,000 inhabitants increased in the same proportion, the greatest gain being 56½ per cent., in San Francisco, and no other place of 200,000 inhabitants gained as much as 40 per cent., except Brooklyn.

Taking this into consideration, the growth of Kansas City has been the most notable. In 1870 it had 31.4 per cent. of the aggregate population of the six cities; in 1880, 33.1 per cent., so that it fully maintains its lead.

However, the two northern towns come but little into competition with the others, and are not included in the railroad companies' classification of "Missouri River points," being supported chiefly by Nebraska traffic, and that of the country beyond reached by the Union Pacific Railroad. If we exclude Omaha and Council Bluffs, these (which together make a town nearly as large as Kansas City) we have the population of the "Missouri River points" growing from 79,752 in 1870 to 119,953 in 1880, which is at the rate of 56.3 per cent., against an increase of 86 per cent. at the two northern towns. Of this population Kansas City had 42 per cent. in 1870, and 46½ in 1880.

The results of the decade seem to put Leavenworth out of the race altogether in the competition for the trans-Missouri trade, and give Kansas City such a lead that it will always remain the chief Missouri River city—at least chief of the southern group. But the rapid growth of St. Joseph and Atchison also indicate that there is not to be such a concentration of trade in one great city as there is at Chicago and St. Louis, but there are to be several moderate cities among whom the trade will be divided. This, however, is not yet settled. Now every one of the railroads that reaches any Missouri River point from the east has been compelled to make a line to Kansas City, and this, for the first time, gives it a chance to concentrate the Kansas traffic.

Council Bluffs and Omaha have now more near-by country in which rapid growth may be expected than any of the towns further south. Until recently they have had to depend chiefly on the traffic of the Union Pacific Railroad, which was a long line without branches. The fertile part of the state south of the Platte was rapidly settled, it is true, but until recently nearly all the railroads that served this country were lines interested in not carrying to Omaha, but rather in sending traffic across the Missouri at Plattsmouth, or still further south. But within the past two years the Union Pacific has built several branches in this district, and, more-

over, the Burlington & Missouri River road, which includes most of the Nebraska lines south of the Platte, has apparently found it necessary to give more attention to carrying to the local markets at Omaha and Council Bluffs, the latter of which it can now reach by its own bridge at Plattsmouth.

But the greatest change in recent years has been the rapid occupation of the part of Nebraska north of the Platte by railroads and settlers. It is somewhat remarkable that after Southern Nebraska was settled for two hundred miles west of the Missouri, there were very few people and few railroads north of the Platte in that state, except for a few miles west of the Missouri. Now here again all has changed within two years. Numerous railroads have been built here, several by the Union Pacific, which carries all its freight to these two towns. The other lines can carry to river crossings further north, but they all have outlets at Omaha, and here and at Council Bluffs it may be possible hereafter to concentrate the traffic of Nebraska pretty completely.

#### Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

*New York & New England*.—Extended from the Connecticut state line west to Brewsters, N. Y., 6 miles.

*Texas & Pacific*.—Extended west to Abilene, Tex., 12 miles.

*Little Rock, Mississippi River & Texas*.—Track laid from Little Rock, Ark., southward to Bayou Fourche, 4 miles.

This is a total of 22 miles of new railroad, making 47 miles reported thus far in 1881.

#### Calvert Street Bridge, Baltimore.

The full-page engraving we give this week shows this structure, which was built in Baltimore during the last year. It carries Calvert street, which is one of the principal streets of Baltimore, across Jones' Falls and the Northern Central Railroad. The latter is located in a ravine, along the stream, which somewhat curiously is called Jones' Falls, although there are no falls in it excepting those produced by mill dams. The grade of the street is considerably higher than the ravine, as is indicated by the engraving.

The bridge has more decoration on it than is often found on iron structures of this kind. Much of this it has been impossible to reproduce in the engraving, excepting so as to show the general effect. Next week we will publish a description and detailed engravings, showing the construction, and also the ornamentation, of the bridge.

#### The Effect of Speed on Train Expenses.

In the *Engineering and Mining Journal* of Dec. 11 appeared the following communication criticising Mr. Albert Fink's "Cost of Passenger Traffic":

The financial prosperity of railways is a matter of primary importance among all civilized communities. It is probably in the United States that the influence of enlightened public opinion is most swift and certain in its action. I therefore ask for room in your columns for a few remarks on a subject which I have already brought forward in the most important journals of the United Kingdom.

I refer to the profound ignorance in which railway shareholders are kept as to the profit and loss of the three main branches of their trade as carriers, namely, passengers, goods that can afford to pay for rapid transmission, and such materials as cannot afford to pay for speed.

In England, no attempt is made to distinguish the cost, and thus the profit or loss, of these different branches of business. The Board of Trade has pointed this out in its reports year after year; but Parliament has not interfered, and the companies refuse to allow any inquiry to be made into the subject.

In France, in Hungary, in Italy, in British India, and in New South Wales, the official returns throw a very distinct light on the question.

In the United States, the details of railway expenditure have been published, in some cases, as by Mr. Albert Fink, with an elaborate care that demands the highest praise. But the same fatal assumption that has caused so much loss in England underlies even these tables. In his "Investigation into the Cost of Passenger Traffic," Mr. Fink remarks: "It may be said that a proper division of this expenditure (that of maintenance of way) should be based upon the relative weight of each class of trains. A division upon this basis would make the cost per mile of a passenger train less than that of freight trains. \* \* In the absence of data from which to determine the relative cost, \* \* we assume the cost of repairs of rails and adjustment of track to be the same for passenger and freight trains."

As the freight trains weigh from two to three times as much as the passenger trains, this assumption, if erroneous, invalidates the accuracy of the whole distribution of cost on the railways of the United States; and by inducing managers to carry non-paying freight at the cost of a lucrative passenger traffic, has tended to produce great disasters.

I am prepared to discuss the question freely. At the present moment, I content myself with adducing three proofs of the truth of my views:

1. Of these the first is the report presented to the Royal Hungarian Academy of Science, by Herr Von Szabo, which has been published in the *Giornale del Genio Civile* (an. 10, p. 367), and of which an abstract is given in vol. 54 of the "Proceedings of the Institution of Civil Engineers." Contrary to his own anticipation, although in accordance with the principles of mechanical law, the professor has ascertained, from the statistics of eleven German railways, that "the speed of the trains has no perceptible influence on the cost of the way."

2. In the investigations as to the substitution of steel for iron rails on the English railways (see "Proceedings of the Institution of Civil Engineers," vol. 26, p. 167), the superior durability of the former, which is to that of the latter as 120 to 7, was measured by the weights of the trains running over the rails.

3. The report of the Commissioner for Railways of New South Wales, for the year 1877, gives details of the net earnings of the different kinds of goods traffic. The earnings of coal, at the freight of one penny per ton per mile, are .027 of a penny, or twenty-seven pounds net profit out of every thousand pounds spent in carriage. A small profit may be acceptable on lines which are very scant of traffic; but when a poor paying trade interferes with a lucrative trade, it becomes a dead loss.



The application of this rule for the correct distribution of working cost may be illustrated thus:

On the Louisville & Nashville Railroad, in 1873, according to the pamphlet by Mr. Fink before quoted, the earnings per mile of a passenger train were \$2.11, and those of a goods train, \$2.41. The operating expenses are tabulated at \$1.42 and \$1.59 per train mile, respectively, leaving a profit of 69 cents and of 89 cents to cover interest. The gross weights of the trains averaged 112.43 tons for passengers, and 259.45 tons for freight. The average working cost all round, was \$1.54 per train. The proportionate working costs, if equally distributed, are 90 cents per mile for the passenger trains, and \$2.07 per mile for the freight trains. Thus the former earns a net profit of \$1.21, while the latter only earns a net profit of 33 cents. This is subject to a small correction depending on the speed of the trains, for which data are not given. But in every line of railway, there is a certain normal speed of maximum economy, depending on cost of fuel, rate of wages and gradients. On most lines in the United Kingdom this normal speed is between 25 and 35 miles per hour, and the cost per mile is increased by any variation of this speed, either in excess or in defect. In the first case, the cost of fuel becomes excessive; in the second case, the payment for wages becomes excessive. It can not be stated, without full information on these particulars, what is the most economical speed for the Louisville & Nashville trains; but the correction to be made on the foregoing figures, in whichever direction it may be due, is not likely to be of great amount.

It will thus be seen that a very slight rebate on charges for freight would render the freight traffic an absolute, as it is already in many cases a partial, loss. It is at the expense of the passenger that low freights are accepted by railway companies.

FRANCIS R. CONDER, C.E.

GUILDFORD, SUSSEX, ENGLAND.

The following reply to the above, by Mr. Fink, appeared in the *Engineering and Mining Journal* of Dec. 25:

In the communication addressed to you by Mr. F. R. Conder, C.E., of Guildford, England, published in your paper of Dec. 11, and headed "Passenger vs. Freight Traffic as a Source of Railroad Revenue," the relative cost of passenger and freight traffic is discussed, and, after speaking of the importance of obtaining correct information upon this subject and the deficiency of English railroad reports regarding it, reference is made to the estimates of relative cost of freight and passenger trains, published by me in a pamphlet on "Cost of Transportation" some seven years ago. Mr. Conder says:

"In the United States, the details of railway expenditures have been published in some cases, as by Mr. Albert Fink, with an elaborate care that demands the highest praise. But the same fatal assumption that has caused so much loss in England underlies even these tables. In his 'Investigation into the Cost of Passenger Traffic' Mr. Fink remarks: 'It may be said that a proper division of this expenditure (that of maintenance of way) should be based upon the relative weight of each class of trains. A division upon this basis would make the cost per mile of a passenger train less than that of freight trains. In the absence of data from which to determine the relative cost, \* \* \* we assume the cost of repairs of rails and adjustment of track to be the same for passenger and freight trains.'"

"As the freight trains weigh from two to three times as much as the passenger trains, this assumption, if erroneous, invalidates the accuracy of the whole distribution of cost on the railways of the United States, and by inducing managers to carry non-paying freight at the cost of a lucrative passenger traffic has tended to produce great disasters."

Mr. Conder then adduces proof which supports the theory that "the speed of the trains has no perceptible influence on the cost of the way," and upon this theory he corrects the estimates I made of the relative cost of passenger and freight trains on the Louisville & Nashville Railroad. Accordingly, he finds that—

The cost of passenger trains per mile should be 90c. instead of \$1.42.  
The cost of freight trains per mile should be \$2.07 instead of \$1.59.

And the Revenue from passenger trains per mile \$1.21 instead of 60c. "freight" " " " 33 cts. " " " 89c.

These are, of course, very great differences between two estimates of the relative cost of passenger and freight traffic based upon the same data. Should it not be possible to establish correct principles leading to nearer approximation of results, all estimates of this kind would possess no practical value. I believe, however, that I shall be able to show that my estimates are correct, and that Mr. Conder has fallen into an error in his endeavors to correct the same.

Mr. Conder assumes that the total cost of maintenance of way per train mile of passenger and freight trains is in exact proportion of the weight of the trains, and he distributes the expense accordingly. The fact is, that only a portion of the expense of maintenance of way is affected by the weight of trains, such as the repairs of the rails and adjustment of track, while other items of cost, and the greater portion of them, are entirely independent of the tonnage passing over the road.

In the accounts kept by the Louisville & Nashville Railroad, the cost of maintenance of way is divided in the following sub-accounts:

1. Repairs and renewal of ballast.
2. Repairs of road tools.
3. Repairs of hand and dump cars.
4. Extraordinary repairs (made necessary by freshets, etc.).
5. Ditching and culvert masonry.
6. Cost of cross-ties.
7. Labor, replacing ties.
8. Train expenses, hauling ties.
9. Wages of watchmen of roadway.
10. Bridge superstructure repairs.
11. Bridge masonry repairs.
12. Bridge watchmen.
13. General expense—office clerks' salaries.
14. Renewal of rails, cost of material.  
Labor, replacing rails.  
Joint fastenings.  
Switches.  
Train expenses, transportation of material.
15. Adjustment of track.

Of these fifteen items, making up the total cost of maintenance of way, items 14 and 15, "Repairs of rail" and "Adjustment of track," are the only items affected by the weight passing over the road, while all the other items—1 to 13—are independent of weight, as will readily occur to the reader by examining the above accounts. It should be understood that in the account of the cost of "adjustment of track" is included the cost of the work of leveling and aligning the track, made necessary by the passage of each train over the road, and nothing else. On a well-built, solid road, this expense will be comparatively small, but upon new and unfinished roads, when the cross-ties are laid upon the soil of which the embankment may hap-

pen to be composed, without broken stone or gravel foundation, the expense will be found considerable, especially in the rainy seasons of the year. The item of cost of "adjustment of track" was purposely ascertained from actual observation on the Louisville & Nashville Railroad (for the last twenty years), in order to estimate the influence of weight of trains upon the cost of repairs. In all other railroad accounts, I believe this item is not reported separately, but is included in and mixed up with the cost of work that is entirely independent of weight, and therefore no correct deductions can be drawn from these reports as to the exact influence of weight upon cost of repairs.

I am perfectly in accord with the theory that the speed of the train has no perceptible influence upon the wear of the rail upon a smooth track, and the cost of repairing rails and of the adjustment of track per train-mile could be estimated in exact proportion of the weight of trains regardless of speed, were it not that the theoretical assumption of a smooth track cannot be realized in practice. When unevenness occurs in the track, defective or open and low joints, which happen, of course, a great deal more upon the new and unfinished railroads in this country, than upon the solidly built and old roads of the old country, the speed of the trains becomes a very serious and important element in the cost of repairing rails and adjustment of track—one that cannot be neglected altogether in any estimates of the cost of operation. What is the exact influence of speed upon the cost is of course impossible to ascertain with mathematical correctness; but this we may safely assume, that the cost due to repairs of rails per ton of a fast train is something more than the cost per ton of a slow train, and that the additional cost due to speed is the greater, the more imperfect the roadway and track.

For this reason, I assumed, in my estimates of the relative cost of passenger and freight trains on the Louisville & Nashville Railroad, which road, at the time these estimates were made, was by no means in perfect condition, that the repairs of rails and adjustment of track (the only two items of cost of maintenance of way affected by weight) for a passenger train weighing one-half of a freight train, but running at double the speed, was the same per mile run as the cost of a freight train: and, in order to show the possible error which might be committed by this assumption, as compared with an estimate based upon the exact relative weight of the trains, I showed that the allowance for the effect of speed would be, at the then cost of material and labor, 5.4 cents per train-mile—a difference, at present prices, reduced by more than one-half. I was further induced to make this additional allowance in the cost of passenger trains on account of the greater weight of the locomotives, relative to the weight of the cars of a passenger train, as compared with the relative weight of a locomotive to the cars on a freight train; upon the ground that a ton of locomotive causes a greater wear to the rail—perhaps from two to four times greater—than a ton of the train it draws—a difference due to the greater concentration of the weight upon the drivers of the locomotive, and also on account of the larger wheel-base of the locomotive. For these reasons, the average wear per ton of passenger trains must be greater than the average wear per ton of freight trains. It was not my intention to assume that the cost of repairs of rail and adjustment of track would be in all cases the same for freight or passenger trains per mile run, independently of their relative weight. I do not agree with the theory advanced by some eminent English engineers, that the speed of the train multiplied by the weight forms the proper measure of the relative wear caused by trains. When the freight trains weigh from three to four times as much as the passenger trains, I would modify this estimate, and would do this also in cases where I had to deal with a perfect road-bed.

It must be borne in mind that my estimate applied to a particular road; upon which it so happened that the average weight of passenger trains was about one-half that of freight trains, and the average speed of passenger trains was about double that of freight trains, and that the condition of the track was then by no means as perfect as it could be, and since has been, made. Upon roads upon which the track is as nearly perfect as practicable, I have no doubt that the relative cost of repairs of rail and adjustment of track per train-mile may be taken more nearly as the weight of the trains. But after all, the difference in estimating one way or the other, not exceeding more than perhaps 2 cents per train-mile, does not materially affect the correctness of the estimate.

The great difference which is shown by a comparison of the estimates as proposed by Mr. Conder with my estimates results from Mr. Conder's erroneous assumption that the total cost of maintenance of way, including the items from 1 to 13, and not only the repairs of rails, should be distributed between passenger and freight trains in proportion to the weight of these trains—items of cost which are entirely independent of the tonnage that passes over the road. What has the decay of ties, the cleaning out of ditches and drains, the repairs of bridges and culverts, the repairs to the road-bed made necessary by rains, snows and storms, to do with the weight of the trains?

In determining the correct principle of distribution of the class of expenses named in accounts of 1 to 13, between freight and passenger traffic, I assume that the railroad was owned by a separate company, and was to be leased to two parties—one to carry on the passenger and the other the freight business, as common carriers, and the proprietor of the road was called upon to make an equitable charge for the use of the roadway to each of these parties. The question would then arise, upon what principle these parties should bear their proper proportions of that part of the cost of the maintenance of way which is uninfluenced by the weight of the trains, namely, the items of cost named in accounts 1 to 13.

The measure of the full capacity and usefulness of the road to the proprietor would be the total number of trains that could be run over the road. If it can be shown that of two roads possessing the same characteristics, one devoted exclusively to passenger traffic, the other to freight traffic, the same number of trains could be run over each when the road is taxed to its full capacity, then the charge for each kind of service per train-mile should be the same, as in each case they would yield the same amount of total revenue to the proprietors.

But if, on the other hand, there was some peculiarity in the service of one or the other class of trains which prevented the same number of trains to be run over two roads possessing the same characteristics, the charges per mile for the passenger and freight trains should be so regulated as to secure to the owners of these two roads the same amount of total revenue on each road, at the time the roads are taxed to their full capacity. It is upon this principle that the expenses enumerated above, from 1 to 13, should be distributed between the passenger and freight trains.

At first sight it may appear that the charges should be regulated according to the relative time which the road is occupied by freight and passenger trains, a basis of estimate which would be in favor of passenger trains. But the speed of the trains does not determine directly the ultimate number of trains that can be run over the road: it is the interval of time at which trains can be safely run apart which determines the ultimate capacity of the road. This

interval depends again upon the speed of the train; but the greater the speed, the greater should be the interval of time between two trains, and the fewer the number of trains. Upon this consideration, the cost per passenger train-mile should be estimated greater than that per freight train-mile.

But upon the other hand, the appliances used for controlling the speed for passenger trains are much more perfect than those used on freight trains, so that a lighter but faster passenger train may be brought to a stop in the same time as a heavier and slower freight train. It is upon this assumption that this is being done that I propose to estimate the ultimate capacity of a road as regards the number of trains that can be run over it to be the same for passenger and for freight trains, and hence the cost per train-mile is estimated the same for the items of expense enumerated from 1 to 13.

It may be said that on account of the greater privileges accorded to the passenger trains, which have the right of way over freight trains, an extra charge should be made for passenger trains. It is true that freight trains have frequently to wait upon passenger trains, by which the ultimate capacity of the road for freight service must be reduced. To the extent to which this reduction would decrease the revenue from freight service, the passenger service should be charged with it.

But it seems hardly necessary to enter into such niceties in an estimate in which, after all, mathematical precision can not be obtained, and I prefer, therefore, to adopt the simple rule according to which the expenses of repairs of roadway, as far as they are uninfluenced by weight of trains, are estimated the same per passenger and freight train-mile. Of course, those who wish to go further into particulars can work out the problem more accurately. I believe the principles upon which the estimates are to be made, as explained above, are correct. Until better advised I shall therefore adhere to the correctness of my estimates as published in the pamphlet from which Mr. Conder has quoted, and must refuse to accept his correction.

I, however, fully agree with Mr. Conder as to the importance he attaches to obtaining more and correct information regarding the relative cost of and revenue derived from the different classes of service performed upon our railroads. He will be entitled to much credit if he can interest railroad managers in the subject, and by an interchange of views lead the way to an agreement as to the correct principles upon which these estimates could be uniformly based.

In conclusion, I will call the attention of English readers of my pamphlet on the "Cost of Transportation," to the fact, that the table published shows the cost of operation of the Louisville & Nashville Railroad from 1867 to 1873; since that time, the cost of railroad operation has been greatly reduced on all the roads in the United States, so that the figures given in my reports give no correct idea of the present state of affairs, but are only useful in showing the methods that should be adopted in keeping and analyzing railroad accounts.

On the main stem of the Louisville & Nashville Railroad the cost per freight ton-mile in 1873 was 1.44 cents, and in 1879 it was 0.767 cents, showing a reduction of 46 per cent. On the Pennsylvania Railroad, the cost per freight ton-mile in 1873 was 0.886 cents, and in 1879 0.483 cents, a reduction of 45 per cent. It is not necessary, and would lead here too far, to enter into the causes which have made possible such a great and general reduction in the cost of transportation, although it would be interesting to account for this change. Apologizing for the already too great length of this communication, I am, respectfully yours,

NEW YORK, Dec. 21, 1880.

ALBERT FINK.

#### Additional Width of Gauge on Railroad Curves.

[Paper by Thomas Doane, read before the Boston Society of Civil Engineers.]

Some two or three years ago, an inquiry was made through the *Railroad Gazette* as to making the gauge of railroad tracks wider upon curves than upon straight lines. The editor asked for information upon that subject, but, so far as I know, the matter has had no further attention, though it is a very important one.

As long ago as 1870, in laying track, I widened the gauge upon curves, but having turned over the road to the operating department upon its completion, I had no opportunity to further study the experiment, and have therefore remained silent.

During a recent visit to the road referred to, I learned something further about it, which may, perhaps, be interesting to the members of our Society; certainly to those who have to do with railroads.

The experiment alluded to above was made upon the Burlington & Missouri River Railroad in Nebraska.

Previous observation had shown me that, though the tracks upon the straight lines and upon the curves had been originally laid to the same gauge, the gauge upon the curves was soon widened out by use. I do not now remember whether my observation showed a movement of but one, or of both rails, but I concluded that the widening of gauge was due to the stiffness of car trucks, and their failure fully to traverse upon the curves, and not to centrifugal motion. If this were the fact, it would even then be probable that the exterior rail of the curve would suffer the greater movement. Simple stiffness of trucks would be likely to affect both rails equally, but adding to this influence that of centrifugal force, unless it be fully counteracted by difference of elevation, and the exterior rail would show the greater displacement.

This condition of things showed a want of fitness between the track and the rolling stock, and a consequent unnecessary, if avoidable, wear and tear upon both, and a waste of motive power.

It seemed to me that if the moving trains were bound to take more room between the rails, that it would be better to give it to them at the first. Then the rails would be firmly seated and remain in their places. If this is not done, and the rails are laid to straight line, or close gauge, then the heads of the rails will be forced apart, the rails will be tipped on to their outer edges, either cutting into the ties or pulling their interior spikes, or both, thus loosening and disjoining the whole permanent way. So long as the gauge remains too narrow for the trains, there must result from the friction between the wheel flanges and the rails great wear and destruction of both.

If the gauge of curves be made open and loose, the coning of wheels will be utilized.

And, further, an engine will haul a larger load than if the train is pinched between rails too closely laid.

And, what is perhaps of more importance than anything else, greater safety is secured upon a track with an open gauge, in which the rails are firmly secured in the places where they are to remain, than upon a loose end and deformed track.

Upon the main line of the Nebraska road, the curve of greatest radius is a 30° curve, and of least radius a 3° 30' curve. In laying track on all curves of less than 2° the gauge was increased from straight line gauge  $\frac{1}{4}$  inch, or to 4 ft. 8 $\frac{1}{2}$  in. and 2° curves and over were laid to a gauge of 4 ft. 9 in., being an increase of half an inch over straight



line gauge. Three sets of gauges were furnished the section men, of the lengths stated above for the curves, with the usual straight line gauge of 4 ft. 8½ in., and the men were held to the use of them, until the road was turned over to the operating department by the engineering and constructing department.

At that time a new road-master came in, who either did not understand, or did not appreciate what had been done by his predecessors, and curved track was gradually brought to the straight line gauge of 4 ft. 8½ in.

Since this road-master left, the tracks upon the curves, while undergoing repairs, have been restored to their original gauges, and have so remained now for several years. The man now in charge says that the practice gives great satisfaction; that the tracks upon the curves are maintained in good condition, at very little expense; that the wear of rails is sensibly diminished; that the engines can haul a maximum load, and that no accidents have occurred from increasing the gauge.

I have been told that, on hearing of laying track with open gauge upon curves, the officers of the Atchison, Topeka & Santa Fe Railroad adopted the plan for their road.

As there was but one curve on the Nebraska road of shorter radius than that of a 3° curve, no attempts were made to widen gauge, more than the half-inch alluded to. I have no doubt, however, that it would be entirely safe and wise to widen to the extent of one inch, or slightly more. The tread of our railroad car wheels is sufficient to prevent the wheel from dropping from the rail even then, and if laid 1½ in. open, the tread of the wheel, as now made, would cover about all of the tread of the rail.

Since writing the above I have had occasion to refer to the matter of resistance of curves to trains; and in an article by Baron Von Weber I find the subject of widening gauge on curves incidentally alluded to. I was therefore mistaken in saying that the matter had no further attention since the inquiry of the Gazette had been made, but as it did not appear under a head distinctly bringing the subject to notice, it may have escaped the eye of the original inquirer, as it did mine.

The experiments of Von Weber were made in 1878-79 and his article, entitled "Train Resistance on Curves," appeared in the *Railroad Gazette* of June 11, 1880.

Item No. 9 of a summary of the above is as follows: A reduction of the additional width of gauge on curves customary on the Bavarian roads, one-half or more, contrary to expectation, caused an increase in the resistance. The additional width given on these roads is:—

Radius in Meters.	Radius in Feet.	Degree of Curve.	Additional Width Gauge in Meters.	Additional Width Gauge in Inches.
750 M.	2,482 feet	2° 18'	0.008 M.	0.32 inch.
550 "	1,822 "	3° 9'	0.014 "	0.56 "
400 "	1,320 "	4° 20'	0.020 "	0.80 "
300 "	993 "	5° 45'	0.025 "	1.00 "

This result, however, cannot as yet be considered as fully established. This is the end of the quotation.

It would seem, then, that the widening of curve gauge upon the railroads of Bavaria is now usual, but how far back the custom extends is not shown by Von Weber's article.

It appears from the experiments that the reducing of the additional width of gauge increased the resistance to the passage of trains. The converse would therefore be true, within certain limits, that an additional width of gauge would decrease the resistance. This is in accordance with my own theory and experience, and it is to be hoped engineers will give the matter further attention and experiment.

The gauge of the tracks of Bavarian railroads is not given in Von Weber's article; but presuming it to be not very different from the standard American of 4 ft. 7½ in., there seems to be a very close agreement between the additional widenings which I gave the curves of different degrees in 1870, and those which are now used on the Bavarian railroads.

If I had been living in a country, or at a time, when engineers were expected to think and work in metrical terms, there might have been a still closer agreement.

#### Sheep-Shearing—A Vermont Fable.

There was a certain Vermont farmer named Brown, who owned a large sheep farm, and who, once on a time, finding himself in difficulties, came down to Boston and consulted his brother-in-law, who was a lawyer, as to ways and means of raising money. The lawyer, who was a keen man of business and had money to spare, agreed to lend the farmer such sums as he required, provided the latter would give him a first mortgage on the sheep farm. The farmer assented to this, the mortgage was duly made and recorded, and the farmer returned home to Vermont with money in his pocket.

Time went on and the farmer paid interest promptly, the same passing through the hands of one John Smith, who was a man of mark in the farmer's neighborhood, and had accordingly been deputed by the Boston lawyer to receive the interest and forward the same to him.

At length, however, Farmer Brown finding little market for his wool, and having invested in certain worthless outlying farms, again fell into difficulties, and this time sought the advice and assistance of his neighbor Smith, who, after looking over the matter, agreed to advance Brown certain sums and take security by mortgage of the farmer's carts, wagons, horses, sheep-shears, and other personal property, the farm itself being already mortgaged to the Boston lawyer.

But Brown still failed to prosper, and at length could pay interest neither to the lawyer nor to Smith. Then it was agreed that his assets should be fairly divided between the two mortgagees, and Squire Joyce, a Justice of the Peace in the neighborhood, who was a member of the same church as Smith, was selected to act as referee. The parties met at the Squire's office, and each spoke for himself, the lawyer first. Said he: "I have a first mortgage on the farm, duly executed and recorded, and of course the farm must belong to me."

"Not much!" said Smith, "I have a mortgage later than yours on the personal property, and if that isn't enough to cover my debt I shall grab the farm too. My equity is superior to yours. Isn't that so, squire?"

The squire hemmed and hawed and finally said to the lawyer: "You consented to Smith's mortgage, didn't you?"

"Never!" said the lawyer.

"That makes no difference," interrupted Smith, "I did it for you!"

"Jes' so, jes' so!" said the squire, "I remember. The whole business was mighty simple. You jest consented to this Boston man's attorney to Brown's making a mortgage to you."

"But what of it," cried the lawyer, "He couldn't give any binding assent to make his mortgage better than mine."

\* It is that, precisely.—EDITOR RAILROAD GAZETTE.

"Perhaps not in law," said the squire; "but in equity, in equity, my dear sir; we go by equity here in Vermont."

"Yes, I call it equity," said the lawyer, sotto voce.

"Besides," said the squire, "I am inclined to believe that it was the intention, as between Smith and Brown, that the mortgage of the carts and fixings should include the farm too—though the writings don't just say so. Wasn't that so, Smith?"

"Certain!" said Smith.

"But that makes no difference," cried the lawyer, "you must go by the record. I've authority to that point," and he produced a bag full of books.

"Young man!" cried Justice Joyce severely, "I'd have you know that this court isn't hide-bound by precedents. I sit here to do equity as I understand it. *Æquitas non sequitur legem.* Amen!"

"That's so, in Vermont, by jingo!" cried the lawyer, waxing wroth.

"Order in the court," cried the squire. "Besides, I mean to make it a rule in my court that the last mortgage shall always have priority. It's so with wills, why not with mortgages? Answer that, you Boston chap!"

The lawyer was dumfounded.

"I find on the whole case," said Squire Joyce, summing up, "that the farm and personality must be sold and Smith's debt and interest paid, no matter what becomes of the Boston man. And Smith, as you say, you have an interest in the wheelwrights' and blacksmiths' shops up to the village and Brown owns a running account at both places, you just bring in those bills and mebbe—I don't say certain, but mebbe—we can fix those up if there's any balance."

The lawyer took his books back to Boston a wiser man. Smith grabbed the farm and sheared the sheep, and said tauntingly to the lawyer, "What are you going to do about it?"—*Springfield (Mass.) Republican.*

Vermont Central bondholders and Vermont & Canada stockholders can doubtless supply the moral for this fable.

#### Transportation in Congress.

In the House on the 26th, the postal appropriation bill being under consideration in Committee of the whole:

Mr. Dwight offered an amendment providing that hereafter the Postmaster General may pay out of the appropriation for transportation on railroad routes to the personal representatives of any employee of the Railway Mail Service who may be killed by a railroad accident while on duty a sum equal to his salary for two years, and making this provision apply to the cases of the men recently burned to death while on duty at Tioga Centre, N. Y. After a long debate the amendment was rejected—31 to 74.

Mr. Brigham offered an amendment requiring railway companies to carry in mail cars safety heaters, and saws, axes and other implements to be used in case of accident. Adopted.

On Jan. 21 the Senate Committee on Railroads authorized Senator Lamar to report for passage a bill to incorporate the Cherokee & Arkansas River Railroad Company, with authority to construct and operate a line of railroad and telegraph from Arkansas City, Kan., to Ft. Smith, Ark., following the general course of the Arkansas River. The bill is a copy of the one now on the House calendar.

The committee also authorized a favorable report upon Senator Teller's bill to authorize the Utah & Northern Railway Company to construct branches in Utah, Idaho and Montana. The bill will be accompanied with amendments extending the same privileges to all other railroad companies in these territories.

The committee having recently reported a bill granting to the Atchison, Topeka & Santa Fe, the Atlantic & Pacific and the South New Mexico companies rights of way through the military reservations of Forts Wingate and Bliss, in New Mexico and Texas; it was decided to incorporate in this bill an amendment granting the same privileges to all other railroad companies that may desire them.

On Jan. 21, at the hearing before the Senate Committee on Public Lands in relation to the lands granted the Ontonagon & State Line Railroad, the Milwaukee, Lake Shore & Western Railroad made a formal proposition to construct a railroad from the Wisconsin state line to Ontonagon within five years, provided the company can obtain such of the lands of the Ontonagon & State Line grant as still remain undisposed of. A bill confirming the titles of all purchasers in good faith within the limits of the railroad grant, and granting the remainder of the lands to Michigan for the benefit of the Milwaukee, Lake Shore & Western Railroad, now before the committee, is meeting with considerable opposition by representatives of the Ontonagon & Brule River Railroad.

### General Railroad News.

#### MEETINGS AND ANNOUNCEMENTS.

##### Meetings.

Meetings will be held as follows: *Huntingdon & Broad Top Mountain*, annual meeting, at the office in Philadelphia, Feb. 1, at noon. *Providence & Worcester*, annual meeting in Providence, R. I., Feb. 7, at 10 A. M. *Philadelphia & Erie*, annual meeting at the office in Philadelphia, Feb. 14, at 11 A. M. *Virginia Midland*, meeting to complete the organization of the new company, in Alexandria, Va., Feb. 1.

##### Foreclosure Sales.

The *Green Bay & Minnesota* road was sold under foreclosure in Milwaukee, Jan. 21, and bought by John I. Blair, of Blairstown, N. J., for \$2,000,000. Mr. Blair acts for himself and other large bondholders. The foreclosure proceedings have been in progress a long time and the sale has been postponed several times. The total bonded debt is \$5,585,350; unpaid interest, \$1,540,090. The road extends from Green Bay, Wis., to Marshland, 209 miles, with a branch to Eastmoor, 3 miles, and from Onalaska to La Crosse, 7 miles, and its trains use the Chicago and Northwestern track from Marshland to Onalaska.

##### Mail Service Extension.

Mail service has been ordered over new railroad lines or extensions, as follows:

*Burlington, Cedar Rapids & Northern*.—Service ordered over the extension of the Pacific Division, from Iowa Falls, Ia., to Clarion, 30 miles, to begin Jan. 20.

*Warwick Valley*.—Service ordered over the extension from Warwick, N. Y., to McAfee Valley, N. J., 12 miles, to begin Feb. 1.

*Sussex*.—Service extended from Franklin Furnace, N. J., to McAfee Valley, 6 miles, to begin Feb. 1.

#### ELECTIONS AND APPOINTMENTS.

*Atchison, Topeka and Santa Fe*.—Mr. H. E. Buck has been appointed General Yard-Master at Grenada, Col. He was formerly on the Columbus & Toledo road.

*Baltimore & Ohio*.—The Baltimore City Council has elected the following city directors in this company: George R. Berry, Wm. A. Boyd, Michael Coakley, W. Starr Gephart, John H. Holthaus, Henry McShane, John G. Medinger.

*Buffalo, Pittsburgh & Western*.—This consolidated company (formerly the Pittsburgh, Titusville & Buffalo) has chosen the following directors: C. H. Clark, J. W. Jones, B. K. Jamison, George F. Tyler, E. A. Rollins, Harold M. Sill, Philadelphia; F. W. Mitchell, Franklin, Pa.; C. O. Pomeroy, New York; Archer A. Martin, Summit, N. J. The board has elected J. W. Jones President; Archer A. Martin, Vice-President; Joseph R. Trimble, Secretary; John K. Wallace, Treasurer.

*Cairo & St. Louis*.—Mr. Henry G. Wood has been appointed General Freight and Passenger Agent, with office in St. Louis.

*Chicago, Burlington & Quincy*.—Mr. C. M. Levey has been appointed Superintendent of the Eastern Division, in place of J. B. Hastings, resigned. Mr. Levey has been heretofore Assistant Superintendent at Burlington.

*Chicago, Rock Island & Pacific*.—Mr. R. W. Justin has been appointed Train-Master of the Illinois Division, with office in Chicago. Mr. A. P. Graves has been appointed Yard-Master at Rock Island.

*Cincinnati*.—At the annual meeting of this company (which leases the Cincinnati Southern) last week the following directors were chosen: Larz Anderson, W. H. Clement, E. S. Cunningham, William Glenn, A. H. Hinkle, J. L. Keck, W. J. Lippincott, G. Y. Ricks, Joseph Rawson, F. E. Roach, Briggs Swift, Jacob Scasongood, Jacob Wirth. The board elected W. H. Clement President; E. S. Cunningham, Vice-President; H. H. Tate, Secretary and Treasurer.

*Colebrookdale*.—At the annual meeting, Jan. 17, the following were chosen: President, J. L. Bailey; directors, J. Lowrie Bell, D. B. Boyer, D. J. Brown, W. A. Church, John C. Smith, Isaac V. Williamson; Secretary, Howard Hancock; Treasurer, John Welch. The road is leased to the Philadelphia & Reading.

*Colebrook Valley*.—The officers of this new company are: President, Robert Coleman; directors, John Benson, J. Taylor Boyd, Christopher Coble, Charles B. Forney, E. C. Freeman, D. S. Hammond; Solicitor, Josiah Funk. Office at Lebanon, Pa.

*Connecticut River*.—At the annual meeting in Springfield, Jan. 19, the following directors were chosen: A. B. Harris, N. A. Leonard, Springfield, Mass.; Oscar Edwards, Northampton, Mass.; W. B. Washburn, Greenfield, Mass.; Charles T. Sargeant, Brookline, Mass.; W. R. Cone, Hartford, Conn.; Frederick Billings, Woodstock, Vt.; Edward A. Dana, I. M. Spelman, Boston. The only new director is Mr. Billings, who replaces Silas M. Waite, the Brattleboro defaulter.

*Denver & New Orleans*.—The directors of this new company are: Wm. Barth, Isaac Brinker, J. S. Brown, Wm. B. Daniels, John Evans, C. W. Fisher, George Fritch, Charles B. Kountze, D. H. Moffatt. Office in Denver, Col.

*East Line & Red River*.—The following circular from W. M. Harrison, President, is dated Jefferson, Tex., Jan. 11:

"Mr. Jno. T. Flynn, has this day been appointed General Manager of this line. All instructions issued by him will be obeyed and respected accordingly. All business communications should be addressed to him."

*Engineers' Society of Western Pennsylvania*.—At the annual meeting in Pittsburgh, Jan. 18, the following officers were chosen for the ensuing year: President, William Metcalf; Vice-President, Thomas Rood; Treasurer, A. E. Frost; Secretary, J. H. Harlow; directors, Samuel Diescher, Francis Phillips.

*Fitchburg*.—At the annual meeting in Boston, Jan. 25, the old board was re-elected as follows: Rodney Wallace, Fitchburg, Mass.; Seth Bemis, Newton, Mass.; Robert Codman, C. U. Colting, Wm. B. Stearns, Boston.

*Franklin Institute*.—At the annual meeting in Philadelphia, Jan. 20, the following officers were elected for the ensuing year: President, William P. Tatham; Vice-President, Charles Bullock; Secretary, Dr. Isaac Norris; Treasurer, Frederick Fraley; managers, to serve three years, Prof. Pliny E. Chase, W. L. Du Bois, Frederick Graft, Washington Jones, A. E. Outerbridge, Jr., Theodore D. Rand, Coleman Sellers, Joseph M. Wilson; auditors, William B. Cooper, Lewis S. Ware. Dr. Isaac Morris was elected a trustee of the Pennsylvania Museum and School of Industrial Art.

*Indianapolis and St. Louis*.—Mr. Thomas Hume has been appointed Train-Master, with office at Mattoon, Ill.

*Island Creek & Richmond Mineral*.—Gen. James S. Negley, of Pittsburgh, has been appointed General Manager and Financial Agent.

*Kansas City & Nebraska Southern*.—The officers of this new company are: President, Kersey Coates; Vice-President, John A. Duncan; Secretary, W. H. Miller; Treasurer, S. B. Armour. Office in Kansas City, Mo.

*Lancaster*.—At the annual meeting in Boston, Jan. 18, the following directors were chosen: F. D. Brigham, Robert Codman, George W. Howe, Amory Maynard, S. R. Merrick, George A. Parker, A. R. Powers, F. W. Warren, C. H. Waters.

*Mitchell, French Lick & Dubois*.—The officers of this new company are: William H. Irwin, President; W. H. Munnell, Vice-President; C. Barfield, Secretary; F. E. Clarkson, Treasurer; directors, William H. Irwin, J. C. Butler, C. Barfield, E. Lockhart, F. E. Clarkson, Charles E. Davis, W. H. Munnell.

*Montreal, Portland & Boston*.—At the annual meeting in Montreal, Jan. 19, the following directors were chosen: Samuel T. Willett, Thomas W. Ritchie, A. B. Chaffee, A. B. Cross, Montreal; Lucius Robinson, Newport, Vt.; B. B. Smalley, Burlington, Vt.; Bradley Barlow, St. Albans, Vt. The board re-elected Samuel F. Willett, President; A. B. Chaffee, vice-President; M. S. Lonergan, Secretary and Treasurer.

*Morgan's Louisiana & Texas*.—Mr. E. M. Underhill has been appointed Auditor, with office in New Orleans.

*New York & New England*.—At a meeting of the board in Boston, Jan. 25, Vice-President James H. Wilson was chosen President in place of W. T. Hart, resigned. No Vice-President was chosen, but the board authorized Gen. Wilson to appoint a General Manager to assist him.

The board also elected William O. Taylor and Jonas H. French directors, in place of Joseph E. Baker and James Sturgis, resigned.

*Peninsula, of Virginia*.—At a meeting of this company in Accomac Court House, Va., last week, the following directors were chosen: William Painter, J. L. Bates, U. H. Painter, W. U. Schoolfield, O. A. Brown, J. D. Kase, E. Westcott. The directors elected William Painter President, and J. L. Bates, Secretary and Treasurer.



**Pennsylvania & New York.**—Mr. Wm. Stevenson has been appointed Superintendent. He has been for several years in charge of the New Jersey Division of the Lehigh Valley road.

**Peoria, Pekin & Jacksonville.**—Mr. Robert Stewart has been appointed General Manager. He was formerly on the Baltimore & Ohio and more recently on the Metropolitan Elevated road.

**Pittsburgh & Chicago.**—At the annual meeting, Jan. 10, the following directors were chosen: Gen. James S. Negley, James S. Negley, Jr., Wm. N. Riddle, Pittsburgh; I. F. Mansfield, Cannelton, Beaver County, Pa.; J. S. Robinson, Kenton, O.; Delos E. Culver, H. R. Low, Grinnell Burt, Gen. Samuel K. Schwenk, New York. The Board elected Gen. James S. Negley, President; Delos E. Culver, Vice-President; James S. Negley, Jr., Secretary; Wm. N. Riddle, Treasurer.

**Pittsburgh & Lake Erie.**—Mr. R. W. Jones has been appointed Master of Transportation.

**Pittsburgh, New Castle & Lake Erie.**—The following directors were recently chosen: Gen. James S. Negley, Wm. N. Riddle, Pittsburgh; John R. McPherson, Charles Siedler, Jersey City, N. J.; H. R. Low, Gen. Samuel K. Schwenk, Grinnell Burt, Wm. B. Scott, Delos E. Culver, New York. The board elected Delos E. Culver, President; Gen. James S. Negley, Vice-President; James S. Negley, Jr., Secretary; Wm. N. Riddle, Treasurer.

**Port Royal & Augusta.**—Mr. Joseph W. White has been appointed Contracting Freight and Passenger Agent.

**Potsdam & Montreal.**—The directors of this new company are as follows: Talcott H. Camp, J. A. Lawyer, Elisha M. Moore, George B. Phelps, Dexter Van Nostrand, Watertown, N. Y.; Theodore Irwin, E. A. Van Horne, Oswego, N. Y.; James J. Belden, Syracuse, N. Y.; James Tillinghast, Buffalo, N. Y.; Willis Phelps, Springfield, Mass.; Wm. E. Dodge, Percy R. Pyne, Samuel Sloan, New York.

**Sioux City & Pacific.**—The following circular from General Manager P. E. Hall is dated Jan. 15:

"Mr. F. C. Hills has been appointed General Traffic Manager of this company, and will hereafter have full control and management of all its commercial business."

"Mr. J. S. Wattle has been appointed Superintendent of all divisions of this company's road, vice F. C. Hills, appointed General Traffic Manager."

**Springfield Southern.**—Mr. Frank Harris has been appointed General Freight Agent, in place of H. W. Mead, who has gone to the Ohio Central.

**Texas & New Orleans.**—At the annual meeting in Houston, Tex., Jan. 10, the following directors were chosen: J. F. Crosby, E. P. Hill, T. W. House, E. W. Taylor, Houston, Tex.; H. K. Sheldon, John T. Terry, New York; T. W. Peirce, Boston. The board re-elected J. T. Terry, President; J. F. Crosby, Vice-President and General Manager; D. F. Merritt, Secretary and Assistant Treasurer; T. W. House, Treasurer; B. W. Watson, Assistant Secretary.

**Union Stock Yards & Transit Co., of Chicago.**—At the annual meeting in Chicago, Jan. 19, the following directors were chosen: John Newell, J. N. McCullough, J. C. McMullin, J. F. Tucker, Marvin Hughitt, S. S. Merrill, Hugh Riddle, J. M. Walker, N. Thayer, Jr.

**Valley of Virginia.**—At the annual meeting in Staunton, Va., Jan. 30, the following were chosen: President, Wm. Keyser; directors, J. A. Allen, for Botetourt County, Va.; W. A. Anderson, for Rockbridge County, Va.; R. W. Burke, for the town of Staunton, Va.; Henry Duval, Decatur H. Miller, for the city of Baltimore; O. Latrobe (and Wm. Keyser), for the Baltimore & Ohio Company. The only new director is Mr. Burke, who succeeds Gen. John C. Echols.

**Vernon, Greensburg & Rushville.**—At the annual meeting in Greensburg, Jan. 18, the following directors were chosen: Will Cumbaek, Courtney Ewing, A. R. Forsyth, W. W. Hamilton, John E. Robbins, Greensburg, Ind.; James Davis, C. Miller, Westport, Ind.; Daniel Bacon, H. Tripp, Vernon, Ind.; Joseph Meek, Clinton, Ind.; George B. Elston, Frank J. Hull, Rushville, Ind.; Horace Scott, Louisville, Ky. The board elected John E. Robbins, President; Horace Scott, Vice-President; A. R. Forsyth, Treasurer; C. Ewing, Secretary.

#### PERSONAL.

—Mr. Joseph E. Baker and Mr. James Sturgis have resigned their positions as directors of the New York & New England Company.

—Mr. James Smith, General Freight Agent of the Chicago & Alton road, was married at Fort Wayne, Ind., Jan. 19, to Miss Mary Ewing Green, of Ft. Wayne.

—Mr. R. Mandeville, Superintendent of the Nineveh Branch of the Delaware & Hudson Canal Company's lines, was caught between two coal cars at Carbondale, Pa., Jan. 18, and had a leg broken.

—Mr. C. O. Richards, Road-Master of the Manhattan Elevated lines in New York, has resigned his position and will go into the bridge-building business. He has already several contracts in Florida.

—Mr. George E. Merchant has resigned his position as Superintendent of the Sioux City & Dakota Division of the Chicago, Milwaukee & St. Paul, to take charge of the Rochester & State Line road.

—The resignation of Mr. W. T. Hart as President of the New York & New England Company was reported last week. Local reports afterward denied that it had been offered, but the truth of the original statement was proved this week, when the board of directors accepted the resignation and elected Mr. Hart's successor. Mr. Hart expressed a desire to withdraw at the time of the annual meeting. He remains a director.

—Hon. Thomas Allen, President, and W. R. Allen, Assistant to the President, of the St. Louis, Iron Mountain & Southern Company, have resigned their positions. Mr. Thomas Allen has sold out nearly all his stock in the road, and intends for the present to devote himself to his duties in Congress. Mr. Allen's connection with the Iron Mountain road has lasted ever since the reorganization after the war, and he has made the road what it is.

—Mr. Jeremiah Bennett, who claimed to be the oldest railroad man in Indiana, died at Shelbyville, in that state, Jan. 21, aged 82 years. He was a native of Cumberland County, N. J., and went to Indiana in 1832. There he planned and helped to build a wooden railroad, the first ever built west of the mountains. On July 4, 1834, the road was completed, being two miles long, and the old wooden car drawn by horses made its first trip. Mr. Bennett was engineer, conductor and brakeman all combined.

—Barclay Haines, who died at his residence in Hainesport, N. J., Jan. 23, aged 70 years, was for many years known throughout New Jersey as chief political manager and lobbyist of the Camden & Amboy Company, and, after

the lease, of the Pennsylvania. He was possessed of remarkable shrewdness and tact, and was personally well liked by everyone, even the opponents whom he often out-generated. He was a Quaker by birth, and always adhered to their peculiarities of dress and speech. It has been said of him that he knew more and said less about it than any man in the state.

—Mr. James M. Walker died suddenly of heart disease at his residence in Chicago, Jan. 22, aged 60 years. He had just returned from a trip east on business, and had complained of some slight indisposition. Mr. Walker was born in New York early in 1821. He graduated from the University of Michigan in 1849. He studied for the bar, and shortly after his admission to practice was elected Prosecuting Attorney of Washington County. He also became local attorney for the Michigan Central Railroad. He became well known as a railroad lawyer. In 1853 he removed to Chicago as the attorney for the Michigan Central Railroad, and soon after became General Solicitor. When the Chicago, Burlington & Quincy was organized, he became Solicitor for that company, and from that time to the day of his death was the legal adviser of that corporation. He was engaged in the practice of his profession in Chicago from 1853 to 1868, ever having a lucrative business, and ranking high among his eminent professional brethren. He had been the senior member of the firms of Walker & Sedgwick, Walker & Dexter, and Walker, Van Arman & Dexter respectively. In 1870 he was chosen President of the Chicago, Burlington & Quincy Company, which position he held for five years, when he resigned and was appointed General Solicitor. Mr. Walker was a man of unusual learning and culture, and had rare attainments as a lawyer. He was incessant in his pursuit of knowledge, and the hard labor of mind to which he subjected himself finally broke his health, and he had been a sufferer for years. He leaves a wife and two sons, aged 16 and 20 years. While not a rich man, it is understood that he leaves a competency to his family.

#### TRAFFIC AND EARNINGS.

##### Railroad Earnings.

Earnings for various periods have been reported as follows:

Year ending Dec. 31:	1880.	1879.	Inc. or Dec.	P. c.
Atchison, Top. & S. F.	\$8,543,185	\$6,381,443	I.	\$2,161,742 33.9
Cairo & St. Louis.	413,166	267,243	I.	145,923 54.7
Des Moines & Fort Dodge.	324,722	225,402	I.	99,320 44.1
Northern Central.	5,050,387	4,107,948	I.	942,439 22.9
Net earnings.	1,785,118	1,246,006	I.	549,112 43.9
Paducah & E. town.	404,193	340,900	I.	63,293 18.6
Pennsylvania.	41,260,072	34,620,379	I.	6,639,793 19.2
Net earnings.	16,635,025	14,237,539	I.	2,397,486 16.8
Eleven months ending Nov. 30:				
Atlanta & Charl.				
Air Line.	\$843,795	\$680,482	I.	\$163,313 24.0
Month of November:				
Atlanta & Charl.				
Air Line.	\$100,772	\$84,871	I.	\$15,901 18.7
Month of December:				
Atchison, Topeka & S. F.	\$850,000	\$619,484	I.	\$230,516 37.2
Cairo & St. Louis.	37,407	28,343	I.	8,764 30.6
Central Iowa.	81,402			
Des Moines & Fort Dodge.	36,094	24,233	I.	12,461 51.5
Ind., Decatur & Springfield.	37,478			
Northern Central.	4,4310	414,698	I.	79,712 19.2
Paducah & E. town.	37,063	37,557	D.	494 0.1
Pennsylvania.	3,547,827	3,453,924	I.	93,903 2.7
Net earnings.	1,126,252	1,512,054	D.	385,802 25.5
Second week in January:				
Chic. & Eastern Ill.	\$31,408	\$16,523	I.	\$14,885 90.2
N. Y. & N. England.	39,322	37,809	I.	1,423 2.6
St. Louis, I. M. & Southern.	132,500	138,875	D.	6,375 4.6
Third week in January:				
Louisville & Nashville.	\$189,632	\$151,700	I.	\$28,932 19.1
Northern Pacific.	27,733	18,378	I.	9,355 50.9
Week ending Jan. 14:				
Great Western.	\$94,973	\$85,763	I.	\$9,210 10.8
Week ending Jan. 15:				
Grand Trunk.	\$193,320	\$177,832	I.	\$15,488 7.0

##### Coal Movement.

Coal tonnages are reported as follows for the week ending Jan. 15:

	1881.	1880.	Inc. or Dec.	P. c.
Anthracite.	333,523	400,549	D.	76,026 18.6
Semi-bituminous.	65,994	81,564	D.	15,570 19.1
Bituminous, Penna.	52,498	39,561	I.	15,935 43.5
Coke, Penna.	51,898	29,664	I.	22,234 74.9

Clearfield and Cumberland trade is reported dull. The rail coal trade of Western Pennsylvania is very active, and the coke trade also. In fact the coke men report that they cannot supply the demand, although they could increase their present shipments 50 per cent. if they could get cars to ship in.

A sharp rise in the Ohio and the breaking up of the ice in the river allowed the Pittsburg coal men to start out a fleet, and on Jan. 23 a large number of boats left, carrying 3,731,000 bushels of coal, of which 1,933,000 bushels were for Cincinnati and 1,714,000 for Louisville.

##### Grain Movement.

For the week ending Jan. 15 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1874.	2,919,179	1,215,756	1,785,547
1875.	1,945,841	515,831	1,470,931
1876.	2,328,480	1,032,384	1,296,096
1877.	1,632,416	638,310	1,217,472
1878.	4,158,086	1,797,607	3,275,956
1879.	3,123,153	1,417,268	2,394,162
1880.	2,739,454	1,157,345	2,575,622
1881.	2,890,312	1,955,339	1,880,419

The receipts of the Northwestern markets for the week this year vary little from those of the two previous weeks, but with one exception are smaller than any of last winter. The great receipts of the corresponding week of 1878 were due to an accumulation of receipts previously kept back by a prolonged "mud blockade." The shipments of these markets are larger than in the corresponding week of any previous year, and though a little smaller than the week before, with that exception the largest for seven weeks. The Atlantic receipts are smaller than in the corresponding week of the last three years, and smaller than in any week of 1880, except that ending Feb. 8.

Of the Northwestern receipts, Chicago had 38.3 per cent., St. Louis 14.8, Peoria 14, Milwaukee 13.8, Toledo 6.5, Detroit 4.5, and Cleveland 4.6 per cent. The wheat receipts were

especially small, and in these Milwaukee led, with Chicago close behind.

Of the Atlantic receipts New York had 40.5 per cent., Baltimore 23.8, Boston 18.9, Philadelphia 13.7, Portland 2.5, Montreal 0.4, and New Orleans 0.2 per cent. At all leading ports except New Orleans there is a gain over the previous week, but New Orleans receipts were perhaps the smallest ever reported—not a hundredth part of those of the previous week.

Exports from Atlantic ports for five successive weeks have been:

	Jan. 10.	Jan. 12.	Jan. 5.	Dec. 29.	Dec. 22.
Flour, bbls.	131,278	180,310	120,499	157,960	138,369
Grain, bush.	1,623,952	1,800,820	2,206,164	2,611,377	2,363,848

The exports seem to grow steadily smaller, but they are probably not small for the season.

#### Chicago Receipts.

Chicago receipts and shipments of grain, flour and hogs for the first three weeks of January have been:

	1878.	1879.	1880.	1881.
Flour bbls.	232,427	185,491	178,387	310,384
Grain, bush.	3,542,954	4,508,187	5,096,733	3,807,010
Hogs, No.	620,368	767,017	398,003	597,475

The flour receipts were largest this year, but the grain receipts were a fourth smaller than last year, and the hog receipts, though much larger than last year, were smaller than in 1878 or 1879.

#### Immigrant Rates.

The New York Central & Hudson River and the New York, Lake Erie & Western companies have followed the cut in immigrant rates made by the Pennsylvania, and all three companies are now selling immigrant tickets in New York to all points at 40 per cent. below the regular tariff rates. The Pennsylvania has since cut 10 per cent. more.

#### Milwaukee Receipts.

For the first three weeks of January receipts at Milwaukee for four years have been:

	1878.	1879.	1880.	1881.
Flour, bbls.	154,041	137,777	115,382	100,406
Grain, bush.	1,531,006	1,440,705	1,283,051	1,149,000
Hogs, No.	91,159	115,328	47,809	64,234

The flour receipts are the largest, but the grain receipts the smallest, of the four years.

#### THE SCRAP HEAP.

##### Locomotive Building.

The Schenectady Locomotive Works, in Schenectady, N. Y., have just delivered 15 locomotives to the Lake Shore & Michigan Southern road.

The Brooks Locomotive Works, in Dunkirk, N. Y., are delivering some freight engines to the Cincinnati, Indianapolis, St. Louis & Chicago road.

The Grant Locomotive Works, in Paterson, N. J., are building 10 engines for the Lake Shore & Michigan Southern road.

The Baldwin Locomotive Works, in Philadelphia, have just received an order for 11 engines for Morgan's Louisiana & Texas road.

The project for establishing locomotive works at South Chicago, in the neighborhood of the new Pullman Car Works, is taking form, and a large amount of money is said to have been subscribed.

It is said that the Rhode Island Locomotive Works, in Providence, have received an order for 100 locomotives for the Chicago, Milwaukee & St. Paul road.

##### Car Notes.

The Erie (Pa.) Car Works are running extra time and turning out 16 freight cars a day.

The Ohio Falls Car Co., at Jeffersonville, Ind., is building several passenger cars for the St. Louis & San Francisco road. They are to have paper wheels.

The car shops at Dauphin, Pa., not in use for some years past, have been sold to Brush & Co., of Philadelphia.

The Barney & Smith Manufacturing Co., in Dayton, O., are building several cars for the Woodruff Sleeping & Parlor Car Co. They are to run between Cleveland and St. Louis.

The Harrisburg Car Co., at Harrisburg, Pa., is turning out 12 box cars a day for the Lake Shore and the New York Central roads.

E. H. Bushnell, at Poughkeepsie, N. Y., reports that his facilities for manufacturing have been enlarged during the past year, and he has still many orders ahead. He has furnished springs for 11,016 car seats, 2,228 car-seat backs and 647 car berths.

##### Bridge Notes.

The Leighton Bridges & Iron Works, in Rochester, N. Y., have taken a contract to build 13 iron bridges over the Erie Canal at different points.

The Massillon Contracting & Building Co., of Massillon, O., is building a long Howe-truss bridge over the Tuscarawas River near New Philadelphia, Ohio.

Melvin Nash has taken a contract to build two iron bridges over the Erie Canal.

The Delaware Bridge Co., of New York, is building a bridge over the Colorado River at Austin, Tex., for the International & Great Northern road, which has six spans of 200 ft. each; also some smaller bridges on the extension of the same road to San Antonio.

##### Iron and Manufacturing Notes.

Mr. O. W. Meysenburg, formerly Secretary and Superintendent of the St. Louis Bolt & Iron Co., has disposed of his entire interest in the rolling mill, and has established an iron commission house and railroad purchasing agency in St. Louis.

The Cuyahoga Steam Furnace Co., in Cleveland, O., has lately built three large helve-hammers for the Louisville Steam Forge Co., and is building another for the Otis Iron & Steel Co., in Cleveland.

The Shickel, Harrison & Howard Iron Co. has been organized in St. Louis, with \$275,000 capital, to make iron tubes and pipes.

The works of the Bethlehem Iron Co., in Bethlehem, Pa., in 1880 turned out 75,350 tons of steel rails. Only 12 working days were lost during the year.

Of the blast furnaces in Lawrence County about Ironton, O., only one was not in blast last year. There were 14 running, and they made 50,538 tons of pig iron during the year.

The American Bolt Co., of Lowell, Mass., which has been running as a firm since 1850, has been incorporated as a company, with James Winter, President, and Robert H. Butcher, Treasurer and Agent. The works are running to their full capacity, about 30,000 bolts a day.

##### The Rail Market.

Steel rails are steady at \$50 to \$61 per ton at mill, with a



good deal of business reported, but no very large transactions.

Iron rails are more active and the mills are reported as well supplied with orders. Quotations are \$46.50 to \$47 per ton at mill for heavy rails, and \$50 to \$53 for light sections. Some sales of foreign rails are reported at \$45 on board at a Southern port.

Old iron rails are firmly held at \$28 to \$30 per ton in Philadelphia, but not many sales are reported.

Railroad spikes are in active demand, and prices range from \$2.65 to \$3 per 100 lbs.; splice-bars, \$2.25 to \$2.35; track-bolts, \$3.75 to \$4.25, according to specification.

#### Running on Two Wheels.

The miraculous escape of a train of cars from a disastrous wreck has just been reported. The train was composed largely of loaded cars, and near the middle of the train was a coal car on which had been loaded a disabled engine driver. When the train arrived at Corry the discovery was made that the coal car had lost both pair of rear trucks and had come into town with no wheels under one end of the loaded car. How such an accident could occur without wrecking the train was a puzzle to all who understand the business. Diligent search was made for the missing wheels, but nothing was heard of them until the following day, when the agent at Columbus reported that the trucks were standing on the side tracks at that station, so that it appears the trucks jumped the track at the station and ran on the switch without injury to the train. The loaded car therefore for four miles was held up by the coupling, which in this case must have been miraculously strong. The train was probably making a speed of eighteen or twenty miles per hour, and the escape from a serious accident is the wonder of all railroad men.—*Pittsburgh Telegraph*, Jan. 25.

#### A Crowded Meeting.

The following is in circulation as an official report:

"The adjourned meeting of the General Passenger and Ticket Agents' Association of Cincinnati met at the Grand Hotel at 11 o'clock Thursday morning, Jan. 13, 1881.

"W. L. O'Brien, General Passenger Agent of the P. & C. & St. L. R. R., being present, elected himself President; on his motion he was also elected Secretary.

"After remaining in session an hour and a half, no other business coming before the meeting, he moved to adjourn. Adjourned accordingly.

"W. L. O'Brien, President *pro tem*.

"W. L. O'Brien, Secretary *pro tem*."

#### An American Railroad in Japan.

Dispatches from Yokohama, Japan, Jan. 8, says: "Just twelve months from the date of the order given for its construction, the first division, 23 miles, of the railroad in Yezo, the northern island of Japan, was opened to traffic, and trains are now run daily at a profit. The line is from Otomari Harbor, on the west coast, via Lapparo, the capital, to the Parom coal fields. It cost \$20,000 per mile, which includes rolling stock, motive power, machinery for terminal repair-shops, etc. The English line built between Tokio and Yokohama cost nearly \$200,000 per mile, and it took five years to complete 18 miles. The Japanese officials are greatly encouraged by the prospect of an American system of rapid transportation. This is the first American railroad in Asia, and was constructed under the direction of Joseph M. Crawford, a Pennsylvanian, all of whose assistants are Americans."

#### An Old Engineer.

Daniel Kenyon is an engineer on the Newark branch of the Erie. Dan has pulled the throttle for the last 35 years. His once raven locks are beginning to turn grey, and his former fine features evidence that old Father Time has played upon his wrinkled front. Still the old man enjoys this life and carries his years well. It may not be generally known that Dan ran the first coal burning engine at Lowell, Mass., in 1845, for Ross Winans, of Baltimore, a prominent railroad man in his time. The engine did not take, and was cast aside. Since then Dan Kenyon has run on all the roads in the country, either traversing the distant prairie, climbing the Alleghenies, wherever his line of calling directed. At present he is only running to keep his hand in, for it has become a second nature to him. Blessed with a good wife and all home comforts, he needs no more. To see him behind his blooded bay he looks as frigid and stolid as when driving his iron charger, and can show more mettle and steam than those who say he is only an engineer.—*Bergen County Democrat*.

#### Long Train.

The heaviest and longest loaded train that passed over the Erie road or its branches, was brought over the Jefferson Branch one day last week by Conductor Stephen Maroney, with G. N. Brown and Jessie Williams as engineers, consisting of 122 eight-wheel cars loaded with coal—all destined for Buffalo.—*Susquehanna Gazette*.

#### OLD AND NEW ROADS.

**Buffalo, Cleveland & Chicago.**—Surveys are being made for this projected line from Cleveland to Buffalo. The line so far run from Cleveland is generally not over a mile from the Lake Shore road.

**Canada Southern.**—A report circulated in New York last week that a lease of this road to the New York Central had been concluded, is denied by authority. It is said also that a new traffic agreement has been made between the two companies, which will secure a large business to the Canada Southern.

**Carthage & Harrisville.**—It is proposed to build a railroad from Carthage, N. Y., northeast to Harrisville, about 25 miles. The line would reach a number of large tanneries and some extensive deposits of iron ore of superior quality. Most of the road will be on the line of an old wooden railroad, which has not been in use for years. An extension of 19 miles from Harrisville north to Gouverneur, where there are large stone quarries, is also proposed.

**Central Pacific.**—The Auditor of Railroad Accounts has been reported as preparing to take legal action to enjoin the payment of the dividend recently declared by this company, on the ground that, if the dividend were paid, the company would be unable to comply with the requirements of the government sinking fund. The company, on the other hand, claimed that such action could not be taken, as the company is not in default on any of its payments to the government. A conference was held in Washington, Jan. 23, at which it was agreed that the government should not interfere with the present payment of the dividend. The following official statement was made by authority of Attorney General Devens: "There is a dispute between the Central Pacific and the United States as to whether certain sums claimed by the road to be applicable to the payment of dividends are properly so applicable. It is understood that the United States will file a bill to test the question whether such sums can properly be used for that purpose, and that if the persons interested in the railroad shall give a bond that in case it is finally decided that such sums should not be used for the payment of

dividends that they will restore them to the treasury of the company, that an immediate injunction will not be pressed for, but that the matter will await final decision upon this bond which, it is understood, will be in the sum of \$750,000. Under these circumstances the dividend will, of course, be paid, as the gentlemen interested in the matter are amply able to furnish the additional security which is required."

#### Chicago, Pekin & Southwestern.—Receiver Reed reports to the Court for December as follows:

Balance, Dec. 1.....	\$16,493.29
Receipts from all sources.....	56,228.30
Total.....	\$72,721.59
Disbursements.....	55,528.21
Balance, Jan. 1.....	\$17,193.38

The receipts exceeded the disbursements by \$700.09. Payments included \$5,000 for new freight cars.

**Chicago, St. Louis & New Orleans.**—This company is making arrangements to fund all its outstanding debt in a new consolidated mortgage, the bonds to bear 5 per cent. interest. The company now has \$17,003,000 bonds outstanding (not including \$500,000, the validity of which is in dispute), of which \$5,937,000 bear 8 per cent., \$3,813,000 bear 7 per cent., and \$7,253,000 bear 6 per cent. interest. The Illinois Central Company holds \$6,600,000 of the bonds. It is thought that 5 per cent. bonds can be placed without difficulty.

**Chicago & West Michigan.**—This company has added to its lines the Grand Haven and the Grand Rapids, Newaygo & Lake Shore roads, in both cases buying the stock of the companies. The Grand Haven road will form a branch from Holland southeast to Allegan, 22½ miles, and a second or loop line, parallel to this company's main line, from Holland north to Muskegon, 35 miles; at the price stated it costs \$11,826 per mile, and last year it failed to earn its working expenses. The Grand Rapids, Newaygo & Lake Shore road will extend this company's Grand Rapids Branch north 46 miles, to a junction with the Big Rapids Branch; this line has heretofore earned the interest on its bonded debt of \$16,870 per mile. The price paid for it is not given. These purchases will free this road from some local competition. They will increase its mileage worked to 349 miles.

**Cincinnati Southern.**—A dispatch from Cincinnati, Jan. 24, says: "A company of capitalists is about to organize to lease the Cincinnati Southern Railroad. The plan is to have a capital of \$6,000,000 to lease the road for 99 years, with a renewal forever, paying out of the profits 4 per cent. on the stock, and 4 per cent. on the city's investment of \$18,000,000. If there is an excess of net earnings they shall be divided between the stockholders and the city *pro rata*, until the city's portion reaches 7 per cent. on \$18,000,000, when the surplus shall be divided equally. It is proposed if this is accomplished to form a combination or pooling arrangement with the Kentucky Central, Chesapeake & Ohio, and the Erlanger lines from Chattanooga."

**Colebrook Valley.**—This company has been organized to build a railroad from Cornwall Furnace, Pa., southwest to the Pennsylvania Railroad, near Conewago Junction, a distance of 17½ miles. Cornwall Furnace is the terminus of the Cornwall Railroad, which runs to that place from Lebanon, 17½ miles distant, and the object of the new road is to connect Lebanon with the Pennsylvania road.

**Columbus, Hope & Greensburg.**—The company heretofore known as the Greensburg & Hope has now adopted this name, having decided to change the terminus of the proposed line. It is to extend from Columbus, Ind., east by north to Greensburg, about 25 miles.

**Connecticut River.**—At the annual meeting in Springfield, Mass., Jan. 19, the stockholders voted to ratify the contract with the Vermont Valley Railroad Company, whereby the superintendent, cashier and assistant treasurer of the latter road are nominated by the directory of the Connecticut River road, and all the accounts of the corporation are kept at the Springfield office. The contract has been in force since 1877, but this is the first time it has been formally ratified.

**Connoton Valley.**—A petition has been filed in the Court of Common Pleas, at Carrollton, O., by Charles G. Patterson, Frank Morrison and others, asking that the transfer of the former Ohio & Toledo road to this company be set aside, and that the road may be sold to pay creditors. This petition covers the 22 miles of road from Dell Roy to Minerva, the extension to Canton having been built by the present company since the transfer.

The stockholders have authorized the execution of a new mortgage on the road and the issue of \$2,600,000 in bonds, of which \$1,125,000 are to be used to retire the bonds heretofore issued by the Connoton Valley Company, and \$662,000 those issued by the Connoton Northern Company. The balance, \$813,000, is to be used to complete the road to Cleveland.

**Deadwood & Red Wing.**—Work has been begun on a railroad, about 40 miles long, from Deadwood, Dakota, to the coal-fields on Red Wing Creek, just across the line in Wyoming. The road follows down the Whitewood Creek from Deadwood about six miles, and thence by means of a tunnel reaches the valley of Spearfish Creek. It is on this tunnel that work is being done this winter. All the iron-work for the road and rolling-stock must be wagoned from Pierre, about 200 miles. The wood-work of the cars and bridges will be made of Hills timber.

**Denver & New Orleans.**—This company has been organized in Denver, Col., to build a line from that city to a point in Northern Texas, to connect there with the Texas & Pacific. Capital stock fixed at \$10,000.

**Denver, Western & Pacific.**—This company has let a contract to Given, Abbott & Co., to grade 34 miles of the line from Denver, Col., westward.

**Fitchburg.**—At the annual meeting in Boston, Jan. 25, the stockholders voted that the directors be authorized to sell and assign the lease of Constitution Wharf in Boston, and sell and convey the property of the company and all rights pertaining thereto on said wharf to the Hoosac Tunnel Dock & Elevator Company, upon such terms as they may approve, and to take all other measures necessary or proper to effectuate and complete such assignment and sale.

**Grand Haven.**—The sale of this road was noted last week, and it is now announced that the purchaser is the Chicago & West Michigan Company.

**Grand Rapids, Newaygo & Lake Shore.**—It is announced that this road has been sold to the Chicago & West Michigan Company, the purchaser taking all the stock and assuming the debt. The price paid for the stock is not stated. The road extends from Grand Rapids, Mich., northward 46 miles to White Cloud on the Big Rapids Branch of the Chicago & West Michigan. By the last report the company had \$593,500 stock and \$778,700 bonds; in 1879 it earned \$130,129 gross, and \$65,340 net, being about \$5,000 in excess of its interest charges.

**Houston & Texas Central.**—This company's representative makes the following statement in the *Galveston News*: "The company will, as soon as the weather becomes settled so that work can be done more easily, make extensive, substantial and permanent improvements all along its lines. First—It has purchased and is now receiving 100 miles of steel rails. Second—Extensive contracts to furnish cross-ties, which will be creosoted, giving them a life of at least twenty years, have been let. Third—A large number of trestle bridges will be replaced with substantial brick culverts. Fourth—The forces engaged in ballasting and the section-hands will be increased during the summer, and the road-bed placed in first-class order. Fifth—The rolling-stock will be increased; 500 freight cars have already been purchased and are now being delivered at the rate of four or five daily."

**International & Great Northern.**—Messrs. Ross, Harris & Co. have the contract for building the extension of this road from San Antonio, Tex., to the Rio Grande, about 150 miles. The same firm has just finished the masonry for the bridge over the Colorado River at Austin, Tex., which has seven piers, each about 50 ft. high, built in the best manner. This bridge is owned by the Colorado Bridge Company, but will be used by this road.

**Island Creek & Richmond Mineral.**—This road was originally intended to run from Steubenville, O., northwest to Richmond in Jefferson County, about 12 miles. The company has now resolved to have a location made of the projected road through to Canton, some 45 miles further.

**Kansas City & Nebraska Southern.**—This company has been organized to build a road from Kansas City, Mo., northwest through Kansas into Nebraska. It is proposed to begin work at once on the section from Kansas City to the Nebraska state line.

**Lake Champlain & St. Lawrence Junction.**—The bondholders who control this road have leased it to the Southeastern Railway Company, of Canada, and it will hereafter be run in connection with the Montreal & Boston Air Line, of which that road forms a part. Heretofore it has been a feeder of the Central Vermont lines. The road is 63 miles long, from West Farnham, P. Q., on the Southeastern road, north to St. Guillaume. An extension from West Farnham south to Phillipsburg, on Lake Champlain, is graded, and another extension is located from St. Guillaume northeast to the St. Lawrence, opposite Trois Rivières. The Southeastern leases it for the interest on \$378,000 bonded debt.

**Little Rock, Mississippi River & Texas.**—This company recently began laying track on the Little Rock end of the extension of its line, and the rails are now laid from Little Rock south to Bayou Fourche, four miles. A gap of 15 miles is to be filled, on which work is in progress from both ends.

**Louisville & Nashville.**—At a special meeting held Jan. 26, the stockholders voted to approve the lease of the St. Louis & Southeastern road, and also the contracts with the Adams and Southern Express companies.

**Midland, of Canada.**—A recent report states that the improvements made on this road by the present managers are: Four miles from Wye River to Midland have been built, and the 14 miles from Waubashene finished and opened; 49½ miles of new steel rails, in addition to the 14 previously laid, have been laid down; 146,965 new ties or sleepers have been laid down and three new iron bridges have been constructed. There have been some 30 miles of ballasting and 50 miles of fencing on portions of the line not previously done. Increased sidings were put down, besides many other repairs. In addition to the 63½ miles of steel rails now laid, it is proposed to secure 1,500 tons, say 18 miles more, and this will leave the balance of the line with a good first-class fish-plate iron rail.

One new locomotive, four new first-class passenger coaches, 120 new platform cars, smoking, baggage, express and mail cars have been added to the rolling stock. Private capital has supplied an elevator at Port Hope and will provide another at Midland; the company has the right at any time to take it over at its cost price, and in the meantime they control it entirely with the rates and so forth.

**Mitchell, French Lick & Dubois.**—This company has filed articles of incorporation in Indiana to build a railroad from Mitchell, on the Louisville, New Albany & Chicago (of which the new road is intended to be a branch) by the French Lick mineral springs to Jasper in Dubois County. The road will be 50 miles long, and the capital stock is to be \$1,000,000.

**New Brunswick.**—The new owners of this road have decided to change the gauge from 3 ft. 6 in. to the standard 4 ft. 8½ in. They are also organizing a company to sell the lands and promote settlement in the neighborhood of the road.

**New York, Boston, Albany & Schenectady.**—This company has executed and recorded a mortgage on its projected road to the Farmers' Loan & Trust Company, of New York, to secure an issue of \$6,000,000 bonds, to be used in building a road from New York to Albany and thence to Schenectady, with a branch to the Hoosac Tunnel.

**New York & New England.**—The Boston *Advertiser* says: "Last April an arrangement was effected between the Boston & Albany and New York & New England railroads, whereby the former was to provide engines and employes for trains running over the Woonsocket Division of the latter between Boston and Brookline. The change has not been satisfactory to either the latter corporation or its employes. It is understood that the old system of running passenger trains on the Woonsocket Division, in connection with Brookline trains, will soon be resumed; that is, that engines and employes of the New York & New England road on inward bound trains will run into Boston, instead of stopping at Brookline, as at present."

The Woonsocket Division does not enter Boston with the main line, but ends at Brookline and its trains run over the Brookline Branch of the Boston & Albany to the depot of that road in Boston.

Tracklaying on the extension of the main line has reached the Harlem road at Brewsters, N. Y., six miles west of the Connecticut line and 190 miles from Boston. Much of the new track is to be ballasted, and it can hardly be finished while the present severe weather lasts.

**New York, Ontario & Western.**—The contractors for the tunnel under Bergen Hill, back of Weehawken, N. J., are Smith, Ripley & Coleman. The contract price is reported to be \$650,000, and the work is to be done in one year.

**Oregon Railway & Navigation Co.**—A correspondent of *The Railroad* writing from Walla Walla, Dec. 5, says of this company:

"In the last year they have entered into an extensive construction of standard gauge railroads throughout Eastern Oregon and Washington Territory. Wherever the development of the country warrants, and their engineers pro-



nounce the construction feasible, a road is being built or is contemplated. They start anywhere, but always end on the Snake or Columbia rivers. They now have a road completed from Walla Walla down the Columbia to the Dalles, with the exception of a break of 36 miles, which is graded. Their cars are running over a branch from Whitman to Blue Mountain station, 14 miles. Part of this road has a 95 ft. grade. Grading has been carried on, all summer, for a line from Walla Walla to Grange City, on the Snake, 45 miles; and on a branch from this road to Dayton, 12 miles. Teams and men are at work grading at Texas Ferry, on the north bank of the Snake, for 175 miles of road running north and northeast.

The cold weather will, in a few days, stop all grading for the winter. Engineers have just reported on a route from Baker City, Oregon, to the Columbia.

Conductors receive \$95 a month; engineers, \$90, \$100 and \$125; brakemen, \$66; firemen, \$66. Mr. J. L. Hallett, the General Superintendent of Construction of the Oregon Railway & Navigation Co., is paid \$5,000 a year; riding bosses, \$2,000 a year; Chinamen \$1 a day, board themselves; white men, \$1.85 a day; two horse team and driver, \$4 a day; four horse team, \$6; six horse team, \$8.

**Pennsylvania.**—Argument on the motion for a writ of sequestration in the Junction Railroad suit was, on Jan. 24, put over until Jan. 28.

Argument has been in progress for several days on the suit, to enjoin the company from interfering with the rights and privileges heretofore enjoyed by the Western Union Telegraph Company over its lines. It is probable that a decision will not be reached this week.

Electric clocks are being put into all the principal stations on the line. They will be worked and controlled by wires from the clock in the main office in Philadelphia.

The company has done a good thing in following the action of the New York Central by prohibiting the sale of flash papers and immoral or doubtful books on the train or in stations. All decent travelers will welcome this order.

Experiments are being made with the electric light in the Jersey City ferry-house and depot.

It is announced that the Pennsylvania Company, "to complete certain financial transactions," will make an issue of \$10,000,000 new 4½ per cent. bonds having 40 years to run. They will be secured by a collateral trust, the leases of the Pittsburgh, Ft. Wayne & Chicago and the Cleveland & Pittsburgh roads being pledged for their payment, and will be guaranteed, principal and interest, by the Pennsylvania Railroad Company. A yearly sinking fund of \$100,000 is also provided for. The whole issue has been taken by a syndicate of bankers, consisting of Kuhn, Loeb & Co., acting for W. L. Scott, of Erie; Drexel & Co., of Philadelphia; the United States Trust Company, Woerishoff & Co., of L. Von Hoffman & Co., Hallgarten & Co., and the National Bank of Commerce, of New York, and L. Cohen & Sons, of London. It is said that the "financial transactions" referred to are the settlement of the Columbus, Chicago & Indiana Central litigation by the purchase of the consolidated bonds of that company.

The December statement shows for all lines east of Pittsburgh and Erie, as compared with December, 1879:

An increase in gross earnings of (2.7 per cent.)	\$93,903
An increase in expenses of (24.7 per cent.)	479,705
Net decrease (25.5 per cent.)	\$385,802

For the twelve months the statement shows an increase in receipt of \$6,639,793; in expenses of \$4,242,307, and in net earnings of \$2,397,486. This makes the year's earnings on all lines east of Pittsburgh and Erie as follows:

	1880	1879	Increase, P. C.
Earnings	\$41,240,072	\$34,620,279	\$4,639,793 13.2
Expenses	24,825,047	20,582,740	4,242,307 20.8
Net earn.	\$16,635,025	\$14,237,539	\$2,397,486 16.8

For the year all lines west of Pittsburgh show a surplus over liabilities of \$3,046,510, being a gain of \$1,422,870 over the previous year.

**Philadelphia & Reading.**—In Philadelphia, Jan. 21, counsel for McCalmont Brothers & Co. presented to the United States Circuit Court an application to admit them as parties in the suit in equity begun by Moses Taylor, under which the Receivers were appointed. This application has not yet been acted upon by the Court.

In Philadelphia, Jan. 24, the Court of Common Pleas made an order directing the managers to file an answer within three days, showing cause why a peremptory mandamus should not be issued to compel them to call the annual meeting at once.

On Jan. 25 application was made to the United States Circuit Court for an injunction to restrain the company from issuing the deferred income bonds, or any bonds under the proposed consolidated mortgage for \$150,000,000. The Court set Jan. 27 for argument as to a preliminary injunction, and Feb. 7 for argument on the main question as to the legality of the bonds. Counsel also asked for an order directing the managers to state whether any contract had been entered into for the building of a line from Williamsport to Buffalo.

It was not generally known at the time, but the Philadelphia & Reading Coal & Iron Company held a meeting on Jan. 10, at which Mr. Gowen was re-elected President.

The Receivers have obtained an injunction restraining Lawrence, Merkle & Co. from extending their coal workings under the ground occupied by the Broad Mountain inclined plane at Frackville, on the ground that such workings would endanger the safety of the plane and cause the track to cave in.

Jan. 26, another bill was filed in the United States Circuit Court by Thomas A. Biddle & Co., to establish the status of the deferred income bonds. The petitioners aver that they have subscribed for and now hold \$495,750 worth of these deferred bonds; that these subscriptions were made on the faith of the statements of the officers of the company, that the legality of the said issue of bonds had been passed upon and finally determined by the Court. The petitioners further aver that they have learned that yesterday a bill in equity was filed by Robert McCalmont and others who are large stockholders of the company defendant, setting forth that the proposed issue was not authorized by the charter of the company and was therefore illegal, and further stating that the issue was not made in accordance with or under the authority of the decree of the United States Circuit Court, and asking an injunction to restrain the defendants from issuing the said obligations. The petitioners affirm their belief that the company is insolvent, and say they have been notified that unless the first installment on their subscription is paid within five days the allotment would be void. They ask the Court for an injunction restraining the company from forfeiting any allotments of deferred bonds proposed to be issued to petitioners and from impairing their rights to the bonds allotted until the proceedings now pending touching the validity of the bonds shall be finally decided.

**Pittsburgh, Titusville & Buffalo.**—The consolidation of this company with the Buffalo, Pittsburgh & Western Company, the Salamanca, Bradford & Allegheny River Company of New York, the Salamanca, Bradford & Alle-

gheny River Company of Pennsylvania, and the Titusville & Oil City Company was completed on Jan. 20 by the votes of the stockholders of the respective companies.

The name of the consolidated company is the Buffalo, Pittsburgh & Western, and it will issue \$1,500,000 preferred stock, \$8,650,000 common stock, and \$7,500,000 first-mortgage bonds. The company owns of completed road the line from Oil City, Pa., to Brocton, N. Y., 89 miles; the line from Oil City to Irvineton, 50 miles; the branch from Titusville to Union, 25 miles, and the branch or loop from Oil City to Pioneer, 9 miles, making 173 miles in all. It purposes building extensions from Brocton to Buffalo, 51 miles, and from Irvineton to Salamanca, N. Y., 50 miles, with a branch of 20 miles to Bradford, making 121 miles projected. When these new lines are finished the company will have 294 miles of road with \$34,524 stock and \$25,510 bonds per mile. The stock and debt have been placed at an amount which, it is believed by the company, will leave sufficient to build the new extensions, after replacing existing securities.

**Pittsburgh & Western.**—A bill in equity has been filed by Grinnell Burt, of New York, to set aside the sheriff's sale of Aug. 27, 1879, under which this road passed to the present company. The bill charges irregularity in proceedings and collusion in the sale, and asks that it be set aside and the property placed in charge of a receiver pending further proceedings to restore it to the original stockholders.

**Potsdam & Montreal.**—This company has been organized to build a railroad from the Rome, Waterton & Ogdensburg near Norwood, N. Y., northeast to the Canada line. It is to be extended to Montreal by a Canadian company.

**St. Paul, Minneapolis & Manitoba.**—This company is reported to be considering the question of building a new line from St. Paul, Minn., to Chicago, desiring an outlet eastward under its own control.

**Securities on the New York Stock Exchange.**—The following securities have been placed on the lists at the New York Stock Exchange:

*New Jersey Southern*, \$1,449,600 first mortgage bonds, guaranteed by New York & Long Branch Company.

*Northern Pacific*, \$20,000,000 general first-mortgage land grant and sinking fund bonds. Until the bonds are issued registered and indorsed certificates will be a good delivery.

*Ogdensburg & Lake Champlain*, \$3,500,000 consolidated mortgage bonds and \$1,000,000 income bonds.

*St. Paul, Minneapolis & Manitoba*, \$2,400,000 Dakota Extension first-mortgage bonds.

**South Atlantic & Ohio.**—Application has been made to the North Carolina Legislature for a charter for this company. The line is from the coal mines in Wise County, in the extreme western part of Virginia, to a connection with the Cape Fear & Yadkin Valley road in North Carolina, then over that road to Fayetteville. Thence the new company purposes building across to the Carolina Central; that road will be used to Wilmington, and a short line built down to Smithville at the mouth of the Cape Fear River. The total distance from Wise County to Smithville is 410 miles, of which this company proposes to build about 175 miles.

**Tehuantepec Intercean.**—This company is now offering to subscription an issue of \$3,000,000 first-mortgage bonds, on its proposed railroad across the Isthmus of Tehuantepec. The bonds are offered at par, and each subscriber will receive, in addition to his bonds, interest-bearing certificates to an amount equal to one-third of his subscription.

**Telegraph Consolidation.**—The proposed consolidation of telegraph lines meets with some opposition. In Ohio and Pennsylvania legislative action against it is proposed.

An application has been made to the New York Supreme Court by Rufus Hatch for an injunction to prevent the consolidation. Argument on the application is now in progress.

In Chicago a plan is on foot to organize one or two companies to build new and independent lines, the first one to be from Chicago to New York.

**Texas & Pacific.**—Track is now laid to Abilene, Tex., 195 miles west of Dallas and 12 miles beyond the point reached at the close of last year. The grading parties are now at work on the Staked Plains.

**Troy & Greenfield.**—The Springfield (Mass.) *Republican* says: "State Engineer Locke has begun within a few days the important work of niching the Hoosac Tunnel in preparation for the laying of a double track through the great bore. These niches will consist of small recesses or chambers cut out of the side of the tunnel to enable workmen to have a place of safety for themselves and their tools while working in the tunnel after the double track is laid. These recesses will be placed 200 feet apart throughout the length of the tunnel. They will be 3½ feet in depth, 8 feet high and 6 feet wide. At an interval of every 3,000 feet a larger niche will be built, the dimensions of which will be 10 feet in depth, 12 feet high, and 8 feet wide. These large niches are designed for construction hand cars and the larger apparatus used in constructing or repairing the tracks and the interior of the tunnel. They will be seven in number. The smaller niches will number nearly 100. A gang of 20 men are now at work, and it will require three or four months to finish the job at a cost of about \$6,000. A large ledge is being removed near Shelburne Falls to make room for another track. The removed rock will be broken up and used for ballast in the tunnel."

**Valley of Virginia.**—At the annual meeting in Staunton, Va., Jan. 20, the President's report showed the net earnings of the 26 miles of completed road for the year ending Sept. 30 to have been \$10,400. By the sale of bonds, etc., the company has during the year paid to the Baltimore & Ohio \$46,700, leaving a balance still due of \$140,000. The suggestions of the report were that the Valley road be completed to Lexington to connect with the Richmond & Allegheny road. This connection would prove very advantageous, as it would make the shortest route from the coal and iron fields to Pittsburgh and the manufacturing centres. A mortgage can be placed to raise a sufficient amount to complete the road to Lexington, 36 miles south of Staunton. The President strongly urged this recommendation as the only means of taking a step forward. The report was referred to a committee and adopted. A mortgage of \$700,000 was authorized to be placed on the road to complete it to Lexington.

**Vickburg & Meridian.**—Notice is given that the Farmer's Loan & Trust Company, of New York, will act as depositary of the securities of this company. Holders of stock and bonds who desire to join in the reorganization are requested to deposit them at once.

#### ANNUAL REPORTS.

The following is an index to the reports of companies which have been reviewed in previous numbers of this volume of the *Railroad Gazette*:

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#### Delaware.

This company owns a line from Delaware Junction, Del., south to Delmar, 84.25 miles; the Smyrna Branch, 1.25 miles; a branch from Townsend to Massey's, 9 miles, and one from Seaford to the Maryland line, 6 miles, making 100.5 miles. The Massey's Branch is leased to the Queen Anne's & Kent, and the Seaford Branch to the Dorchester & Delaware, leaving 85.5 miles worked. The road is leased to the Philadelphia, Wilmington & Baltimore for 30 per cent. of the earnings; the lessee pays all interest and 6 per cent. dividends, a deficit in any year to be repaid from the earnings of future years. The report is for the year ending Oct. 31, 1880.

The Treasurer's account is as follows:

Stock (\$14.617 per mile)	\$1,468,994.41
Bonded debt (\$6.478 per mile)	651,000.00
Current accounts	47,901.49
Sinking funds	42,429.48
Total	\$2,210,325.38
Road and branches (\$21.059 per mile)	\$2,216,432.55
Sundry accounts	3,532.65
Trustees of sinking fund	42,429.48
Cash and cash items	47,930.70
Total	2,210,325.38

The bonded debt consists of \$650,000 convertible bonds guaranteed by the lessee, and \$1,000 bond and mortgage.

The earnings for the year were as follows:

	1879-80	1878-79	Inc. or Dec. P. C.
Passengers	\$146,358.77	\$141,158.32	I. 5,200.45 3.7
Freight	268,647.98	296,954.11	D. 27,306.13 9.2
Mails, etc.	10,258.28	10,250.28	I. 8.00 0.1

Total	\$426,265.03	\$448,362.71	D. \$22,097.68 4.9
Paid lessee 70 per cent.			
for working	298,385.52	313,853.90	D. 15,468.38 4.9

Net earnings	\$127,879.51	\$134,508.81	D. \$6,629.30 4.9
Interest and dividends	129,773.74	132,330.45	D. 2,556.71 1.9

Loss or gain to lessee, L.	\$1,894.23	\$2,178.36	
Gross earn. per mile	4,965.56	5,244.01	D. \$278.45 4.9

The deficit is charged to the company, to be repaid to the lessee out of future surplus earnings.

The train mileage was as follows:

	1879-80	1878-79	Inc. or Dec. P. C.
Passenger	145,593	134,742	I. 10,851 8.1
Freight	183,318	190,270	D. 6,952 3.7
Service	2,855	4,151	D. 1,296 31.2
Total	331,766	329,163	I. 2,603 0.8

The report says: "The loss in freight is due to the smallness of the peach crop, and to the fact that the greater part of the crop being in the upper part of the state, the haul on your line of road was short."

"Your property has been kept in its usual good condition by the lessee. In accomplishing this, 304 tons of steel, 445½ tons of iron, 292 tons of mended iron rails and 38,540 cross ties, with a due proportion of other materials, have been used."

"The appropriations to the sinking fund for the last year were sufficient to pay off the first note for \$7,000 referred to in our last annual report, and leaving a surplus of \$1,448.38."

"The construction account has been increased during the past year by consent of the lessor and lessee to the amount of \$8,641.67, upon which the lessee is to pay 6 per cent. per annum to the lessor. The main items making up this amount consist of the difference in cost between steel and iron rail and the additional difference in weight of the new rails and the old ones taken up, the substitution of iron fish plates in place of wooden ones, the extension of side tracks, new fencing, and the cost to the Dover and Milford survey."

#### Cincinnati Southern.

The Cincinnati Railway Company, which operates this road under lease from the Trustees, makes the following statements for the year ending Dec. 31, 1880.

The earnings for the year were as follows:

Passenger	\$345,918.80
Freight	1,069,416.56
Mail and express	54,128.19
Miscellaneous	22,865.18

Total (\$4,902.07 per mile)	\$1,485,328.73
Expenses, not including track repairs (39.51 per cent.)	586,900.19

Net earnings (\$2,965.11 per mile)	\$898,428.54
Interest allowed on lessee's capital	67,121.22

Net amount paid Trustees	\$831,307.32
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There were 158 miles worked from Jan. 1 to March 8; on that date the road was opened through to Chattanooga, 336 miles. It was, however, at the time of opening incomplete in many respects, affecting more particularly the receipt and delivery of freight at Cincinnati and Chattanooga, no sufficient provision for depots at either place having been made for the transaction of that class of business in a manner satisfactory to shippers of the company. Since that date greatly increased facilities for the handling of local freight at Cincinnati have been obtained, and also arrangements for connections with and transfers to and from the other roads entering the city, and for connection with the stock yards. Additional yard and station room in Cincinnati is still much needed. Local business was much interrupted by severe storms and the bad condition of the country roads in December. No comparisons are made, as only 158 miles were worked in 1879.

The receipts and disbursements for the year were as follows:

Balance on hand Jan. 1, 1880	\$ 539,435.94
Receipts on road account	1,515,942.37
Receipts on calls on capital stock	449,225.00
Miscellaneous	54,068.55

Total	\$2,558,671.86
Operating expenses	\$ 586,900.19
Interest on capital stock issued	67,121.22
Trustees for rent of road	777,233.32
New equipment, etc.	1,028,372.61
	2,459,627.34

Balance Jan. 1, 1880	\$99,044.52
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The President says: "The through and local business of the road has more than met our expectations, and would have been largely increased during the summer and autumn if our freight equipment had been sufficient to do the business offered. But we were disappointed by the contractors in the delivery of both cars and locomotives, and up to this date a contract for six freight locomotives, to have been delivered in October, November and December, has not been met by the delivery of one of the number agreed to be furnished."

The report speaks at some length of the resources of the country along the line, timber, limestone and iron ore.



## REPORTS OF NEW YORK RAILROADS TO THE STATE ENGINEER AND SURVEYOR FOR THE YEARS ENDING SEPT. 30, 1890, AND SEPT. 30, 1879.

NAME OF ROAD	YEAR	Miles of road	Miles of track	Number of locomotives	NUMBER OF CARS.				Capital stock	Funded debt	Floating debt	Cost	TRAIN MILES.		
					1st class pass.	2d class pass.	Baggage mail and express.	Freight					Passenger	Freight	Service
15. Brooklyn, Flatbush & Coney Island	1880	7.5	7.5	7	42	1	2	8	\$500,000	\$500,000	\$336,273	\$1,510,712	133,134	1,507	.....
	1879	7.5	7.5	7	44	1	2	8	500,000	580,000	289,877	1,477,469	118,500	1,500	.....
16. Brooklyn, & Rockaway Beach	1880	3.5	3.5	3	10	1	1	8	150,000	64,455	.....	242,162	44,870	.....	.....
	1879	3.5	3.5	3	11	1	1	8	150,000	58,000	.....	242,162	44,870	.....	.....
17. B. & C. Creek*	1880	4.23	4.23	3	.....	.....	.....	.....	250,000	.....	97,220	325,915	.....	800	.....
	1879	4	4	2	.....	.....	.....	.....	250,000	.....	90,000	302,915	.....	.....	.....
18. Buffalo, New York, & Phil.	1880	120.6	145.5	31	13	1	5	1,616	2,125,650	4,000,000	465,441	6,915,750	156,534	503,870	.....
	1879	120.6	144.7	31	12	1	5	1,350	2,004,250	3,556,500	1,039,802	6,801,048	132,394	483,334	.....
19. Cayuga & Susquehanna†	1880	33.7	39.7	6	2	.....	.....	2	589,110	.....	18	600,000	42,357	31,403	.....
	1879	34.6	40.6	5	2	.....	.....	.....	589,110	.....	.....	600,000	45,351	22,839	.....
20. Cazenovia, Canastota & De Ruyter	1880	28.6	30.6	2	.....	.....	.....	12	614,000	726,000	20,059	1,216,378	58,919	25,432	.....
	1879	28.6	30.6	2	.....	.....	.....	12	614,000	620,000	8,290	1,216,378	78,627	33,933	.....
21. Chemung‡	1880	17.8	23.9	.....	.....	.....	.....	.....	380,000	.....	.....	380,000	63,795	16,890	.....
	1879	17.8	23.9	.....	.....	.....	.....	.....	380,000	.....	.....	380,000	60,082	147,297	.....
22. Clove Branch	1880	4.3	4.3	1	.....	.....	.....	50	150,000	.....	13,328	175,896	19,765	.....	.....
	1879	4.3	4.3	1	.....	.....	.....	50	150,000	.....	.....	164,300	15,814	.....	.....
23. Cooperstown & Susquehanna Valley	1880	16	16.3	2	.....	.....	.....	10	308,405	132,000	2,965	493,128	26,496	.....	.....
	1879	16	16.3	2	.....	.....	.....	10	308,405	132,000	.....	493,128	26,496	.....	.....
24. Corning, Covesque & Antrim	1880	64	72.1	8	.....	.....	.....	.....	1,900,000	375,000	.....	1,900,000	62,000	99,810	.....
	1879	64	72.1	8	.....	.....	.....	.....	1,900,000	450,000	.....	1,900,000	62,000	93,112	.....
25. Elmira, Jefferson & Canadaigua	1880	46.7	57.2	5	4	.....	.....	13	500,000	300,000	26,544	538,659	89,468	230,770	.....
	1879	46.7	57.2	5	4	.....	.....	13	500,000	300,000	25,500	538,659	89,468	230,770	.....
26. Fonda, Johnstown & Gloversville	1880	26.2	27.5	5	4	.....	.....	10	300,000	300,000	.....	535,205	48,744	8,890	.....
	1879	26.2	27.5	5	4	.....	.....	10	300,000	300,000	.....	535,205	48,744	8,890	.....

NAME OF ROAD	YEAR	Number of passengers	Passenger miles	Tons carried	Ton-miles	GROSS EARNINGS.				WORKING EXPENSES.				Net earnings	Interest	Dividends
						Passenger	Freight	Other	Total	Main line of road	Maintenance of equip.	Operating	Total			
15.	1880	1,004,502	7,533,765	7,114	49,798	169,333	3,616	32,150	205,107	9,980	6,693	83,225	95,877	109,230	66,706	.....
	1879	873,960	6,554,706	7,328	51,296	160,025	3,348	33,678	203,051	8,450	7,494	84,184	100,128	102,924	55,200	.....
16.	1880	276,774	2,308,208	2,087,292	17,442	27,013	7,869	3,776	38,658	2,293	2,700	16,943	21,936	8,731	5,926	.....
	1879	239,308	2,087,292	1,742	19,742	27,013	7,869	3,776	38,658	2,293	2,700	16,943	21,936	8,731	5,926	.....
17.	1880	452,302	3,782,625	2,087,292	17,442	27,013	7,869	3,776	38,658	2,293	2,700	16,943	21,936	8,731	5,926	.....
	1879	452,302	3,782,625	2,087,292	17,442	27,013	7,869	3,776	38,658	2,293	2,700	16,943	21,936	8,731	5,926	.....
18.	1880	236,989	5,163,884	1,063,256	88,948,101	154,471	846,512	30,364	1,031,347	330,113	98,451	258,860	687,424	343,931	237,350	54,600
	1879	207,239	4,163,650	83,907,397	128,305	797,081	29,257	954,683	251,946	70,841	251,532	574,327	380,335	256,860	.....	53,019
19.	1880	25,199	465,172	2,323,744	14,491	45,524	3,957	63,073	21,565	7,035	20,141	57,741	6,232	.....	.....	.....
	1879	21,672	440,596	2,308,315	13,640	40,218	4,071	57,930	18,545	7,225	20,589	55,370	5,530	.....	.....	.....
20.	1880	47,768	840,741	34,218	933,965	24,667	31,628	4,968	61,564	25,131	5,280	34,464	64,974	Deficit	5,000	.....
	1879	59,358	1,042,408	29,215	879,917	24,667	24,668	5,875	54,541	22,738	8,085	27,440	53,372	.....	.....	.....
21.	1880	114,433	2,023,339	1,012,918	21,053,230	39,505	119,725	5,407	164,637	27,442	19,226	88,067	134,744	29,902	.....	.....
	1879	118,714	1,787,343	867,283	17,449,065	40,027	92,488	4,955	137,470	39,227	17,033	82,117	138,777	.....	.....	.....
22.	1880	2,544	7,093	75,529	251,001	267	25,933	796	23,997	5,626	2,771	8,588	16,485	10,512	.....	.....
	1879	2,277	6,272	52,811	174,804	230	25,933	1,070	23,997	4,141	1,850	9,698	15,657	.....	.....	.....
23.	1880	31,236	430,224	14,471	15,128	16,380	16,917	2,176	35,472	8,644	4,939	11,432	25,015	10,457	9,368	.....
	1879	31,236	430,224	14,471	15,128	16,380	16,917	2,176	35,472	8,644	4,939	11,432	25,015	10,457	9,368	.....
24.	1880	21,931	312,780	11,935	106,761	14,406	16,274	2,257	32,938	9,726	1,612	19,158	19,917	13,029	12,500	.....
	1879	21,931	312,780	11,935	106,761	14,406	16,274	2,257	32,938	9,726	1,612	19,158	19,917	13,029	12,500	.....
25.	1880	130,128	2,818,305	911,625	33,070,385	56,023	190,903	114,167	49,204	43,102	192,721	255,087	59,079	17,987	2,796	.....
	1879	101,170	2,292,164	728,880	26,749,836	54,974	176,831	10,102	241,903	62,813	23,349	151,426	242,816	Deficit	.....	.....
26.	1880	110,651	1,170,489	61,311	595,456	41,671	64,272	16,675	121,062	35,282	61,236	98,824	23,137	3,328	.....	.....
	1879	107,335	894,092	45,700	496,892	35,704	53,758	14,501	104,023	15,514	5,345	37,370	58,239	45,793	2,858	6,650

\* Owned by Lehigh Valley Company.

† Leased by Delaware, Lackawanna &amp; Western.

‡ Leased by Northern Central Company.

§ Leased by Fall Brook Coal Company, which furnishes equipment.

Mixed trains.

Settlements are gradually being made, and the country is filling up.

Refere, ce is made to the proposed branch to Knoxville, and its construction is recommended. It will be a valuable connect on, and will also pass through a considerable body of coal lands.

Believing that to induce sufficient capital to invest in this extension some permanent lease or contract must be made, the board had a form of lease for 25 years upon terms based on the amount of gross earnings per mile of road. The proposition is still with the Trustees.

## Richmond &amp; Danville.

This company during the fiscal year ending Sept. 30, 1880, worked the following lines:

Main line, Richmond, Va., to Danville	140.5
Freight branches in and about Richmond	13.0
Piedmont R. R., Danville to Greensboro, N. C.	48.5

Total, Richmond & Danville Division	202.0
Northwestern North Carolina, Greensboro to Salem	20.0
North Carolina R. R., Charlotte to Goldsboro	253.0

Total, Richmond & Danville Division 451.0

The Piedmont Railroad, nominally leased, is really owned, this company holding all the stock and guaranteeing the bonds. The Northwestern North Carolina is also substantially owned, and was built by this company, which holds all the securities.

The company owns a controlling interest in the Charlotte, Columbia & Augusta road, which extends its line from Charlotte to Augusta, Ga., 195 miles.

The equipment in use on all the lines consists of 63 engines; 16 first-class passenger, 14 second-class passenger, 6 passenger and baggage, 6 baggage and express, 4 postal, 4 mail and baggage, and 8 express cars; 623 box, 16 stock, 219 flat, 35 stone flat, 12 gondola, 44 coal and 31 caboose cars; 2 pay cars, 1 officers' car and 26 shanty cars. There was an increase of 7 engines: 148 box, 11 flat, 12 gondola, 6 coal and 3 caboose cars. One postal car also was bought.

The general account, somewhat condensed, is as follows:

Stock (\$19.141 per mile)	\$3,866,400.00
Bonds (\$18.007 per mile)	3,617,500.00
Balance due on Virginia State loan of \$800,000	428,638.63
Bills and accounts payable, September pay-rolls	208,010.87
Current accounts and traffic balances	103,728.41
Profit and loss	123,723.97
Total	\$8,368,610.88

Road and property (\$8.300 per mile)	\$5,879,633.47
Piedmont R. R. (\$94.380 per mile)	1,607,354.98
N. W. N. C. stock and bonds	280,631.49
J. N. DuBarry, in trust	94,250.00
Bonds, stocks, etc.	28,836.15
Supplies and fuel	158,205.75
Current accounts and balances receivable	162,186.50
Cash	80,112.54
Total	\$8,368,610.88

The bonded debt consists of \$3,400 first-mortgage bonds, \$3,000 second-mortgage bonds and \$1,243,100 consolidated mortgage bonds and \$2,388,000 general mortgage bonds. During the year \$106,000 first-mortgage bonds and \$523,800 consolidated bonds were retired, and \$660,000 general mortgage bonds issued, a net increase of \$30,200 in the bonded debt. The Virginia state loan was decreased by \$79,827.37 during the year. There was no increase in cost of road and property.

The earnings of all the lines, 451 miles, were as follows:

	1879-80.	1878-79.	Increase.	P. c.
Passage	\$508,395.16	\$432,415.75	\$75,979.41	17.6
Freight	1,275,888.96	1,145,373.75	130,515.21	11.4
Mail, express, etc.	148,577.31	121,314.01	27,263.30	22.5
Total	\$1,932,861.43	\$1,699,103.51	\$233,757.92	13.8
Expenses	1,146,407.58	957,228.92	189,238.66	19.8
Net earnings	\$786,393.85	\$741,874.59	\$44,519.26	6.0
Gross earnings per mile	4,285.72	3,765.99	519.73	13.8
Net earnings per mile	1,743.67	1,644.33	99.34	6.0
Per cent. of expenses	59.30	56.30	3.00	.....

The large increase in expenses was due to the payments for new equipment and improvements of road, \$192,347.47 having been what may fairly be called extraordinary expenses. The division of earnings and expenses among the several lines was as follows:

	Gross.	Net.	Gross.	Net.
Richmond & Danville	\$1,243,271.23	\$407,614.27	\$6,155	\$2,465
North Carolina	632,356.47	232,221.64	2,836	1,131
N. W. North Carolina	57,233.73	36,237.94	2,201	1,394
Total	\$1,932,861.43	\$786,393.85	\$4,286	\$1,744

The net earnings of the Northwestern North Carolina are credited as interest on investments. The rental of the North Carolina Railroad is \$260,000 yearly, showing a loss on the lease of \$7,773.36, against \$35,906.60 the previous year, and \$140,340.18 two years ago. The income and profit and loss accounts were as follows:

Net earnings Richmond & Danville road.....		\$497,934.27
Interest on investments.....		57,485.14
Total.....		\$555,419.41
Interest on funded and floating debt.....	\$254,315.16	
"    Piedmont bonds.....	60,000.00	
Loss on North Carolina lease.....	7,773.36	
		322,093.52
Surplus for the year.....		\$233,325.89
Premium on county bonds sold and on Virginia coupons.....		42,541.87
Sundry accounts.....		3,997.56
Total.....		\$279,865.32
Debit balance, Sept. 30, 1879.....	\$93,136.40	
Discount on general mortgage bonds.....	23,000.00	
Sundry accounts.....	30,004.95	